

SMITHSONIAN MATHEMATICAL TABLES

HYPERBOLIC FUNCTIONS

PREPARED BY

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ADVERTISEMENT.

Among the early publications of the Smithsonian Institution was a very important volume of meteorological tables by Dr. Arnold Guyot. They were so widely used by geographers and physicists as well as by meteorologists that when the fourth edition was exhausted it was decided to recast the entire work and publish three separate volumes, Meteorological Tables, Geographical Tables, and Physical Tables, each of which has now passed through several editions.

In the application of the data of these volumes to the study of natural phenomena certain mathematical tables beside those included in ordinary tables of logarithms are urgently needed in order to save recurrent computation on the part of observers and investigators. It was therefore decided to publish the present volume of Mathematical Tables, on Hyperbolic Functions.

Hyperbolic Functions are extremely useful in every branch of pure physics and in the applications of physics whether to observational and experimental sciences or to technology. Thus whenever an entity (such as light, velocity, electricity, or radioactivity) is subject to gradual extinction or absorption, the decay is represented by some form of Hyperbolic Functions. Mercator's projection is likewise computed by Hyperbolic Functions. Whenever mechanical strains are regarded as great enough to be measured they are most simply expressed in terms of Hyperbolic Functions. Hence geological deformations invariably lead to such expression, and it is for that reason that Messrs. Becker and Van Orstrand, who are in charge of the physical work of the United States Geological Survey, have been led to prepare this volume.

CHARLES D. WALCOTT, *Secretary.*

WASHINGTON, D. C., April, 1909.

In this first reprint of the Hyperbolic Functions a few misprints of trifling importance have been corrected and four values of the exponential have been changed by a unit in the eighth significant place.

April, 1911.

C. D. W.

In the second reprint of these Tables, several additional minor corrections have been made, usually in the last decimal place.

November, 1920.

C. D. W.

In the third reprint, a number of minor errors have been corrected, a list of publications containing hyperbolic and exponential functions has been added to historical note on page 31, and the tables of circular functions and the exponential been extended to meet recent demands.

May, 1924.

C. D. A

In this fourth reprint no need for corrections has been discovered.

September, 1931.

C. G. Abbott, *Notepad*

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DEFINITIONS AND FORMULAS.

The hyperbolic functions are named the hyperbolic sine, cosine, tangent, cotangent, secant, and cosecant from their close analogy to the circular functions, the tangent being the ratio of the hyperbolic sine to the cosine and the other three functions being reciprocals of these, as in circular trigonometry. They are usually denoted by adding *h* to the symbols of the circular functions, as $\cosh x$ for the hyperbolic cosine of *x*, $\sinh x$ for the hyperbolic sine of *x*, etc.¹

Historically speaking, the hyperbolic functions were evolved from studies of the hyperbola. They might have been developed from the geometry of the ellipse or the catenary or that of other curves. These functions, however, may be considered independently of any geometrical interpretation and can be derived from very fundamental functional theorems.

At least two methods have been devised of defining circular and hyperbolic functions analytically. One of these is due to Mr. Yvon Villarceau,² and is so extremely brief that it can be given here in a somewhat modified form.

It has long been known that

$$e^{2\pi i x} = 1; \quad e^{\pi i} + i \sin \pi = e^{\pi i}; \quad e^{i\pi + 2\pi i x} = e^{i\pi}.$$

The second of these equations has a single imaginary period, $2i\pi$, and the third a single real period, 2π . Hence every exponential e^x in which *x* is real has a single imaginary period, $2i\pi$, and every exponential with the same base, but with an imaginary exponent, has a real period, 2π . Now, all real purely circular functions may be expressed in terms of constants and exponentials with purely imaginary exponents, and all real hyperbolic functions may be expressed in terms of constants and exponentials with exclusively real exponents.

Hence hyperbolic functions may be defined as the singly periodic exponential functions with real exponents. The circular functions are then the singly periodic exponential functions with imaginary exponents.

It remains to be considered how, from this point of view, the hyperbolic functions of complex variables are to be regarded. The question almost answers itself; for

$$e^{x+iy} = e^x \cdot e^{iy},$$

¹ More compendious and convenient, but less usual, is the notation employed by B. de Saint-Venant, $\sinh x$, $\cosh x$, $\tanh x$.

² *Comptes Rendus, Paris*, vol. 83, 1876, p. 594.

which is evidently the product of two functions: one circular, the other hyperbolic. Such functions have a real period and an imaginary one, since they are single-valued they are not elliptic functions.

The circular and hyperbolic functions being defined as above, it is now as a matter of convenience that a few of the simpler combinations of exponentials receive special names, as sine, cosine, etc.

The other analytical method of generalizing the two classes of function is due to Edward Lucas,¹ and is too long to be given here in full, but method may be indicated. If α and β are the two roots of the equation

$$x^2 - Px + Q = 0,$$

where P and Q are positive or negative whole numbers, then two functions may be defined as follows:

$$U_n = \frac{\alpha^n - \beta^n}{\alpha - \beta}; \quad V_n = \frac{\alpha^n + \beta^n}{2},$$

and these functions are related by the equation

$$U_n^2 + U_n V_n = V_n^2 - 1.$$

Lucas develops and studies these functions, limiting n at first to whole positive numbers. He finds that all the theorems resulting from this study can be converted into those of ordinary trigonometry when P is replaced by $2 \sin \alpha$ and V by $2 \cos \alpha$. He infers that between the limits 1 and minus 1 , α may be replaced by any real value, and shows that the theorems dealing with U and V when translated into trigonometric formulas on this assumption can be verified. By substituting for α an imaginary argument, the hyperbolic functions also are found to be comprehended in the general functions U and V .

Both the circular and hyperbolic functions may further be regarded as integrals of the equation

$$\frac{d}{dx} \log \frac{d^2 y}{dx^2} = \frac{d}{dx} \log P, \text{ or } \frac{d^2 y}{dx^2} = Q,$$

If $\epsilon = \alpha^2$, this gives

$$\frac{y}{\alpha} = Ae^{\alpha x} + Be^{-\alpha x},$$

where A and B are arbitrary constants; so that the integral expression includes $\sinh x$, $\cosh x$, and the sum or difference of these functions.

If $\epsilon = -\beta^2$,

$$\frac{y}{\beta} = A_1 \cos \beta x + B_1 \sin \beta x.$$

¹ Am. Jour. of Math., vol. 1, 1878, p. 184.

The hyperbolic functions may also be defined geometrically with reference to any hyperbola.

Let $OA = a$, $OB = b$ be the semi-axes of the hyperbola AP , and its conjugate BP' referred to the rectangular axes ox and oy . The argument or independent variable x and its functions are then given by:¹

$$x = \frac{\text{sector } OAP}{\Delta OAB}, \sinh x = \frac{\Delta OAP'}{\Delta OAB},$$

$$\cosh x = \frac{\Delta OPB}{\Delta OAB} \text{ etc.}$$

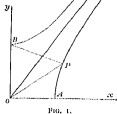


FIG. 1.

The areas of the triangles OAB , OAP , and OPB are respectively $\frac{1}{2}ab$, $\frac{1}{2}ay$ and $\frac{1}{2}bx$, and the area of the sector OAP is found from the equation of the hyperbola,

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1,$$

to be

$$S = \frac{ab}{2} \log \left(\frac{x}{a} + \frac{y}{b} \right).$$

Hence, in accordance with the above definitions,

$$x = \frac{2S}{ab} = \log \left(\frac{x}{a} + \frac{y}{b} \right),$$

$$\sinh x = \frac{y}{b} = \frac{1}{2} (e^x - e^{-x}),$$

$$\cosh x = \frac{x}{a} = \frac{1}{2} (e^x + e^{-x}).$$

Similarly the argument and functions of circular trigonometry are:

$$\theta = \frac{2S}{a^2} = \frac{\text{arc}}{\text{radius}},$$

$$\sin \theta = \frac{y}{r} = \frac{1}{2} (e^{i\theta} - e^{-i\theta}),$$

$$\cos \theta = \frac{x}{r} = \frac{1}{2} (e^{i\theta} + e^{-i\theta}).$$

A comparison of the preceding equations shows that there exist between the two sets of arguments and functions many interesting analogies and relations. The arguments are in each case the ratio of two areas, although the argument of the circular functions may also be defined as a ratio of two lines;

¹For definitions which are independent of the position of the sectorial areas see Prof. James McMahon's "Hyperbolic Functions" and a paper "On the Introduction of the Notion of Hyperbolic Functions," by Prof. M. W. Haskell, Bull. Am. Math. Soc., vol. 1, 1894-95.

the hyperbolic functions stand in the same relation to the *equilateral* hyperbola as the circular functions do to the circle; each set of functions may be defined analytically as a particular branch of the theory of the exponential function, and it is possible to pass from the one to the other by means of imaginary $i = \sqrt{-1}$. For example,

$$\begin{aligned}\sinh u &= -i \sin iu, \\ \cosh u &= \cos iu, \\ \tanh u &= -i \tan iu.\end{aligned}$$

Furthermore, every rational function of the hyperbolic functions, and its inverse can be integrated by the help of corresponding known integrals of circular functions. Thus, to find $\int \operatorname{sech} u \, du$ from

$$\int \sec u \, du = \frac{1}{2} \log \frac{1 + \sin u}{1 - \sin u} = \log \frac{1 + \tanh \frac{u}{2}}{1 - \tanh \frac{u}{2}},$$

substitute $i u$ for u and reduce to the form

$$\int \operatorname{sech} u \, du = \frac{1}{i} \log \frac{1 + i \tanh \frac{u}{2}}{1 - i \tanh \frac{u}{2}}.$$

If in this equation $\tanh \frac{u}{2}$ is replaced by x , the second member coincides form with the expression for $2 \tan^{-1} x$ given below.

Hence

$$\int \operatorname{sech} u \, du = 2 \tan^{-1}(\tanh \frac{u}{2}) = x \, du.$$

Similarly, when a differential is encountered the integral of which is not to be found in this collection, it is expedient to deduce the corresponding expression in cyclic functions by substitution of ix for x , etc., and then to make a search for its integral.

Most interesting is the relation existing between the formulæ of spherical trigonometry and the formulæ of Lobachevsky's imaginary geometry, hyperbolic geometry, or pseudo-spherical geometry, as it is sometimes called. Lobachevsky defines the angle CPA as the angle of parallelism, the line PC being the limiting position of PB when the distance AB is infinite. In this geometry two parallels, PC

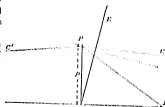


FIG. 2.

and PC , may be drawn from a point P to a line AB ; the sum of the angles of a triangle is less than two right angles, and the angle of parallelism $\Pi(\rho)$ is dependent upon the perpendicular distance ρ of the point P from the line AB . If now any line passing through A , such as AE , is extended until the perpendicular erected at its middle point is parallel to AB , the locus of the points E is a boundary curve, and the revolution of this curve about AB or one of its parallels develops a boundary surface. It is upon this surface of constant negative curvature that Lobachevsky imagines a triangle of sides a, b, c and angles A, B, C to be drawn. He establishes as fundamental relations between the sides and angles of this triangle¹

$$\begin{aligned}\sin A \tan \Pi(a) &= \sin B \tan \Pi(b) = \sin C \tan \Pi(c), \\ \sin \Pi(b) \sin \Pi(c) &= \sin \Pi(a) - \cos \Pi(b) \cos \Pi(c) \sin \Pi(a) \cos A, \\ \sin \Pi(a) \cos A &= -\cos B \cos C \sin \Pi(a) + \sin B \sin C,\end{aligned}$$

and also proves that

$$\begin{aligned}\sin \Pi(n) &= (\cos in)^{-1} = (\cosh n)^{-1}, \\ \tan \Pi(n) &= i(\sin in)^{-1} = (\sinh n)^{-1}, \\ \cos \Pi(n) &= -i \tan in = \tanh n.\end{aligned}$$

Hence the preceding equations may be written

$$\begin{aligned}\frac{\sin A}{\sinh a} &= \frac{\sin B}{\sinh b} = \frac{\sin C}{\sinh c}, \\ \cosh a &= \cosh b \cosh c - \sinh b \sinh c \cos A, \\ \cos A &= -\cos B \cos C + \sin B \sin C \cosh a.\end{aligned}$$

These formulas are, in fact, precisely those of spherical trigonometry, in which the real sides a, b, c have been replaced by the imaginaries ia, ib, ic . If the triangle on the boundary surface is infinitesimal, the above equations reduce to the well-known relations between the sides and angles of a triangle on the Euclidean plane. The theorems of non-Euclidean geometry may not therefore be inconsistent with experience, for the largest triangle which we can measure is infinitesimal in comparison with a triangle on the boundary surface. Lobachevsky pointed out that a triangle on a boundary surface would correspond to a triangle connecting three stars in distant parts of the universe, and that the postulates of his geometry, involving as they do the question of the curvature of space, would be capable of experimental proof if the parallaxes of distant stars could be measured with sufficient accuracy.

Lastly, there is an important relation between the numerical values of the circular and hyperbolic functions. If the argument x assumes successive values between 0 and $+\infty$, $\sinh x$ assumes successive values between 0 and $+\infty$ just as $\tan x$ does when x varies from 0 to 90° ; $\cosh x$ assumes values between 1 and $+\infty$ like $\sec \beta$, and $\tanh x$ assumes values between 0 and 1

¹ H. P. Manning's *Non-Euclidean Geometry*, p. 60.

in the same way as $\sin \gamma$. The variation of the hyperbolic functions throughout the entire plane and their similarity to the circular functions between the limits 0° and 180° is shown in the diagram. Since each of the functions is single-valued, there must be a single value of u , β , γ corresponding to a particular value of x , such that

$$\begin{aligned}\sinh u &= \tan \alpha, \\ \cosh u &= \sec \beta, \\ \tanh u &= \sin \gamma.\end{aligned}$$

It will be found by substituting in the trigonometric formulae that $u = \beta = \gamma = \phi$, and the required relations are therefore

$$\begin{aligned}\cosh u &= \sec \phi, \\ \sinh u &= \tan \phi, \\ \tanh u &= \sin \phi.\end{aligned}$$

The angle ϕ which renders it possible to evaluate the hyperbolic functions by means of the circular functions is of great importance in pure and applied mathematics. Some of its properties and applications will be considered in the section on geometrical illustrations. It is called *germanian* u and is written

$$\phi = gd\ u.$$

The following list of formulae involving the hyperbolic functions might be greatly extended, but it includes the most useful relations.¹

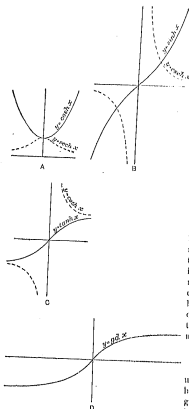


FIG. 3.

¹ Taken with additions from Prof. B. O. Peirce's *Short Table of Integrals*, and Prof. McMahon's *Hyperbolic Functions*.

A.—RELATIONS BETWEEN HYPERBOLIC AND CIRCULAR FUNCTIONS.

1. $\sinh u = -i \sin iu = \tan gd u,$
2. $\cosh u = \cos iu = \sec gd u,$
3. $\tanh u = -i \tan iu = \sin gd u,$
4. $\tanh \frac{1}{2} u = \tan \frac{1}{2} gd u,$
5. $e^u = (1 + \sin gd u) + \cos gd u,$
 $= [1 - \cos (\frac{1}{2} \pi + gd u)] + \sin (\frac{1}{2} \pi + gd u),$
 $= \tan (\frac{1}{2} \pi + \frac{1}{2} gd u).$
6. $\sinh iu = i \sin u,$
7. $\cosh iu = \cos u,$
8. $\tanh iu = i \tan u,$
9. $\sinh (u \pm iv) = \pm i \sin (v \mp iu),$
 $= \sinh u \cos v \pm i \cosh u \sin v,$
10. $\cosh (u \pm iv) = \cos (v \mp iu),$
 $= \cosh u \cos v \pm i \sinh u \sin v,$
11. $\cosh (miv) = \cos m\pi. \quad (m \text{ is an integer.})$
12. $\sinh (2m+1) \frac{1}{2} i\pi = i \sin (2m+1) \frac{1}{2} \pi. \quad (m \text{ is an integer.})$

B.—RELATIONS AMONG THE HYPERBOLIC FUNCTIONS.

13. $\sinh u = \frac{1}{2} (e^u - e^{-u}) = -\sinh (-u) = (\operatorname{csch} u)^{-1}$
 $= 2 \tanh \frac{1}{2} u + (1 - \tanh^2 \frac{1}{2} u) = \tanh u + (1 - \tanh^2 u)^{\frac{1}{2}},$
14. $\cosh u = \frac{1}{2} (e^u + e^{-u}) = \cosh (-u) = (\operatorname{sech} u)^{-1},$
 $= (1 + \tanh^2 \frac{1}{2} u) + (1 - \tanh^2 \frac{1}{2} u) = 1 + (1 - \tanh^2 u)^{\frac{1}{2}},$
15. $\tanh u = (e^u - e^{-u}) \div (e^u + e^{-u}) = -\tanh (-u),$
 $= (\coth u)^{-1} = \sinh u \div \cosh u = (1 - \operatorname{sech}^2 u)^{\frac{1}{2}},$
16. $\operatorname{sech} u = \operatorname{sech} (-u) = (1 - \tanh^2 u)^{\frac{1}{2}},$
17. $\operatorname{csch} u = -\operatorname{csch} (-u) = (\coth^2 u - 1)^{\frac{1}{2}},$
18. $\coth u = -\coth (-u) = (\operatorname{csch}^2 u + 1)^{\frac{1}{2}},$
19. $\cosh^2 u - \sinh^2 u = 1,$
20. $\sinh \frac{1}{2} u = \sqrt{\frac{1}{2} (\cosh u - 1)},$
21. $\cosh \frac{1}{2} u = \sqrt{\frac{1}{2} (\cosh u + 1)},$
22. $\tanh \frac{1}{2} u = (\cosh u - 1) \div \sinh u,$
 $= \sinh u \div (1 + \cosh u) = \sqrt{(\cosh u - 1) \div (\cosh u + 1)},$
23. $\sinh 2u = 2 \sinh u \cosh u = 2 \tanh u + (1 - \tanh^2 u),$
24. $\cosh 2u = \cosh^2 u + \sinh^2 u = 2 \cosh^2 u - 1,$
 $= 1 + 2 \sinh^2 u = (1 + \tanh^2 u) + (1 - \tanh^2 u),$
25. $\tanh 2u = 2 \tanh u \div (1 + \tanh^2 u),$
26. $\sinh 3u = 3 \sinh u + 4 \sinh^3 u,$
27. $\cosh 3u = 4 \cosh^3 u - 3 \cosh u,$
28. $\tanh 3u = (3 \tanh u + \tanh^3 u) \div (1 + 3 \tanh^2 u).$

29. $\sinh nx =$

$$n \cosh^{n-1} x \sinh x + \frac{n(n-1)(n-2)}{6} \cosh^{n-3} x \sinh^3 x + \dots$$
30. $\cosh nx = \cosh^n x + \frac{n(n-1)}{2} \cosh^{n-2} x \sinh^2 x + \dots$
31. $\sinh u + \sinh v = 2 \sinh \frac{1}{2}(u+v) \cosh \frac{1}{2}(u-v),$
 32. $\sinh u - \sinh v = 2 \cosh \frac{1}{2}(u+v) \sinh \frac{1}{2}(u-v),$
 33. $\cosh u + \cosh v = 2 \cosh \frac{1}{2}(u+v) \cosh \frac{1}{2}(u-v),$
 34. $\cosh u - \cosh v = 2 \sinh \frac{1}{2}(u+v) \sinh \frac{1}{2}(u-v),$
 35. $\sinh u + \cosh u = (1 + \tanh \frac{1}{2}u) \div (1 - \tanh \frac{1}{2}u),$
 36. $(\sinh u + \cosh u)^n = \cosh nu + \sinh nu,$
 37. $\tanh u + \tanh v = \sinh(u+v) \div \cosh u \cosh v,$
 38. $\tanh u - \tanh v = \sinh(u-v) \div \cosh u \cosh v,$
 39. $\coth u + \coth v = \sinh(u+v) \div \sinh u \sinh v,$
 40. $\coth u - \coth v = -\sinh(u-v) \div \sinh u \sinh v,$
 41. $\sinh(u \pm v) = \sinh u \cosh v \pm \cosh u \sinh v,$
 42. $\cosh(u \pm v) = \cosh u \cosh v \pm \sinh u \sinh v,$
 43. $\tanh(u \pm v) = (\tanh u \pm \tanh v) \div (1 \pm \tanh u \tanh v),$
 44. $\coth(u \pm v) = (\coth u \coth v \pm 1) \div (\coth v \pm \coth u),$
 45. $\sinh(u+v) + \sinh(u-v) = 2 \sinh u \cosh v,$
 46. $\sinh(u+v) - \sinh(u-v) = 2 \cosh u \sinh v,$
 47. $\cosh(u+v) + \cosh(u-v) = 2 \cosh u \cosh v,$
 48. $\cosh(u+v) - \cosh(u-v) = 2 \sinh u \sinh v,$
 49. $\tanh \frac{1}{2}(u+v) = (\sinh u + \sinh v) \div (\cosh u + \cosh v),$
 50. $\tanh \frac{1}{2}(u-v) = (\sinh u - \sinh v) \div (\cosh u + \cosh v),$
 51. $\coth \frac{1}{2}(u+v) = (\sinh u - \sinh v) \div (\cosh u - \cosh v),$
 52. $\coth \frac{1}{2}(u-v) = (\sinh u + \sinh v) \div (\cosh u - \cosh v),$
 53. $\frac{\tanh u + \tanh v}{\tanh u - \tanh v} = \frac{\sinh(u+v)}{\sinh(u-v)},$
 54. $\frac{\coth u + \coth v}{\coth u - \coth v} = -\frac{\sinh(u+v)}{\sinh(u-v)},$
 55. $\sinh(u+v) + \cosh(u+v) = (\cosh u + \sinh u)(\cosh v + \sinh v),$
 56. $\sinh(u+v) \sinh(u-v) = \sinh^2 u - \sinh^2 v,$

$$= \cosh^2 u - \cosh^2 v,$$

 57. $\cosh(u+v) \cosh(u-v) = \cosh^2 u + \sinh^2 v,$

$$= \sinh^2 u + \cosh^2 v,$$

 58. $\sinh(mi\pi) = 0, \quad (m \text{ is an integer}),$
 59. $\cosh(mi\pi) = (-1)^m,$
 60. $\tanh(mi\pi) = 0,$
 61. $\sinh(u + mi\pi) = (-1)^m \sinh u,$
 62. $\cosh(u + mi\pi) = (-1)^m \cosh u,$
 63. $\sinh(2m + 1)\frac{1}{2}i\pi = \pm i.$

$$64. \cosh (2 n \pm i) \frac{1}{2} i \pi = 0.$$

$$65. \sinh \left(\frac{i \pi}{2} \pm u \right) = i \cosh u.$$

$$66. \cosh \left(\frac{i \pi}{2} \pm u \right) = \pm i \sinh u.$$

$$67. \tanh (u + i \pi) = \tanh u.$$

C.—INVERSE HYPERBOLIC FUNCTIONS.

$$68. \sinh^{-1} u = \log (u + \sqrt{u^2 + 1}) = \cosh^{-1} \sqrt{u^2 + 1} = \int \frac{du}{(u^2 + 1)^{\frac{1}{2}}}.$$

$$69. \cosh^{-1} u = \log (u + \sqrt{u^2 - 1}) = \sinh^{-1} \sqrt{u^2 - 1} = \int \frac{du}{(u^2 - 1)^{\frac{1}{2}}}.$$

$$70. \tanh^{-1} u = \frac{1}{2} \log (1 + u) - \frac{1}{2} \log (1 - u) = \int \frac{du}{1 - u^2}.$$

$$71. \coth^{-1} u = \frac{1}{2} \log (1 + u) - \frac{1}{2} \log (u - 1) = \int \frac{du}{1 - u^2} = \tanh^{-1} \frac{1}{u}.$$

$$72. \operatorname{sech}^{-1} u = \log \left(\frac{1}{u} + \sqrt{\frac{1}{u^2} - 1} \right) = - \int \frac{du}{u(1 - u^2)^{\frac{1}{2}}} = \cosh^{-1} \frac{1}{u}.$$

$$73. \operatorname{csch}^{-1} u = \log \left(\frac{1}{u} + \sqrt{\frac{1}{u^2} + 1} \right) = - \int \frac{du}{u(u^2 + 1)^{\frac{1}{2}}} = \sinh^{-1} \frac{1}{u}.$$

$$74. \sin^{-1} u = -i \sinh^{-1} iu = -i \log (iu + \sqrt{1 - u^2}).$$

$$75. \cos^{-1} u = -i \cosh^{-1} u = -i \log (u + i \sqrt{1 - u^2}).$$

$$76. \tan^{-1} u = -i \tanh^{-1} iu = \frac{1}{2i} \log (1 + iu) - \frac{1}{2i} \log (1 - iu).$$

$$77. \cot^{-1} u = i \coth^{-1} iu = \frac{1}{2i} \log (iu - 1) - \frac{1}{2i} \log (iu + 1).$$

$$78. \sin^{-1} iu = i \sinh^{-1} u = i \log (u + \sqrt{1 + u^2}).$$

$$79. \cos^{-1} iu = -i \cosh^{-1} iu = \frac{\pi}{2} - i \log (u + \sqrt{1 + u^2}).$$

$$80. \tan^{-1} iu = i \tanh^{-1} u = \frac{i}{2} \log (1 + u) - \frac{i}{2} \log (1 - u).$$

$$81. \cot^{-1} iu = -i \coth^{-1} u = -\frac{i}{2} \log (u + 1) + \frac{i}{2} \log (u - 1).$$

$$82. \cosh^{-1} \frac{1}{2} \left(u + \frac{1}{u} \right) = \sinh^{-1} \frac{1}{2} \left(u - \frac{1}{u} \right) = \tanh^{-1} \frac{u^2 - 1}{u^2 + 1}$$

$$= 2 \tanh^{-1} \frac{u - 1}{u + 1} = \log u.$$

$$83. \tanh^{-1} \tan u = \frac{1}{2} \pi \text{ if } 2 u.$$

$$84. \tanh^{-1} \tanh u = \frac{1}{2} \pi \text{ if } 2 u.$$

$$85. \cosh^{-1} \csc 2 u = -\sinh^{-1} \cot 2 u = -\tanh^{-1} \cos 2 u = \log \tan u.$$

$$86. \tanh^{-1} \tanh^2 \left(\frac{1}{2} x + \frac{1}{2} u \right) = \frac{1}{2} \log \csc u.$$

$$87. \tanh^{-1} \tanh^2 \frac{1}{2} x = \frac{1}{2} \log \sec u.$$

$$88. \cosh^{-1} u \pm \cosh^{-1} v = \cosh^{-1} \{ u v \pm 1 \pm (u^2 - 1)(v^2 - 1) \}.$$

$$89. \sinh^{-1} u \pm \sinh^{-1} v = \sinh^{-1} \{ u \pm 1 \pm (u^2 + 1)(v^2 + 1) \}.$$

D.-SERIES.

$$90. e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \dots \quad (1)$$

$$91. \log u = (u-1) - \frac{1}{2}(u-1)^2 + \frac{1}{3}(u-1)^3 - \dots \quad (2)$$

$$92. \log u = \frac{u-1}{u} + \frac{1}{2} \left(\frac{u-1}{u} \right)^2 + \frac{1}{3} \left(\frac{u-1}{u} \right)^3 + \dots$$

$$93. \log u = 2 \left[\frac{u-1}{u+1} + \frac{1}{3} \left(\frac{u-1}{u+1} \right)^3 + \frac{1}{5} \left(\frac{u-1}{u+1} \right)^5 + \dots \right]$$

$$94. \log (1+x) = x - \frac{1}{2}x^2 + \frac{1}{3}x^3 - \frac{1}{4}x^4 + \dots \quad (3)$$

$$95. \log \left(\frac{1+x}{1-x} \right) = 2 \left[x + \frac{1}{3}x^3 + \frac{1}{5}x^5 + \frac{1}{7}x^7 + \dots \right] \quad (4)$$

$$96. \log \left(\frac{u+1}{u-1} \right) = 2 \left[\frac{1}{u} + \frac{1}{3} \left(\frac{1}{u} \right)^3 + \frac{1}{5} \left(\frac{1}{u} \right)^5 + \dots \right] \quad (5)$$

$$97. \sinh u = u + \frac{u^3}{3!} + \frac{u^5}{5!} + \frac{u^7}{7!} + \dots \quad (u^1)$$

$$= u \left(1 + \frac{u^2}{3!} \right) \left(1 + \frac{u^2}{5!} \right) \left(1 + \frac{u^2}{7!} \right) \dots \quad (u^1)$$

$$98. \cosh u = 1 + \frac{u^2}{2!} + \frac{u^4}{4!} + \frac{u^6}{6!} + \dots \quad (u^2)$$

$$= \left(1 + \frac{u^2}{2!} \right) \left(1 + \frac{u^2}{4!} \right) \left(1 + \frac{u^2}{6!} \right) \dots \quad (u^2)$$

$$99. \tanh u = u - \frac{1}{3}u^3 + \frac{2}{15}u^5 - \frac{17}{315}u^7 + \dots \quad (u^3)$$

$$100. u \coth u = 1 + \frac{1}{3}u^2 - \frac{1}{45}u^4 + \frac{2}{945}u^6 - \dots \quad (u^2)$$

$$101. \operatorname{sech} u = 1 - \frac{1}{2}u^2 + \frac{5}{24}u^4 - \frac{61}{720}u^6 + \dots \quad (u^2)$$

$$102. u \operatorname{csch} u = 1 - \frac{1}{6}u^2 + \frac{7}{360}u^4 - \frac{31}{15120}u^6 + \dots \quad (u^2)$$

$$103. \operatorname{gd} u = \phi = u - \frac{1}{6}u^3 + \frac{1}{24}u^5 - \frac{61}{5040}u^7 + \dots \quad (u \sin)$$

$$= \frac{\pi}{2} - \operatorname{sech} u = \frac{1}{2} - \frac{\operatorname{sech}^2 u}{3} - \frac{1}{24} \frac{\operatorname{sech}^4 u}{5} - \dots \quad (u \log)$$

$$104. u = g^{d-1} \phi = \phi + \frac{1}{6} \phi^3 + \frac{1}{24} \phi^5 + \frac{61}{5040} \phi^7 + \dots \quad \left(\phi < \frac{\pi}{2} \right)$$

$$105. \sinh^{-1} u = u - \frac{1}{2} \frac{u^3}{3} + \frac{1}{2} \frac{3}{4} \frac{u^5}{5} - \frac{1}{2} \frac{3}{4} \frac{5}{6} \frac{u^7}{7} + \dots \quad (u^2 < 1.)$$

$$= \log 2u + \frac{1}{2} \frac{1}{2u^2} - \frac{1}{2} \frac{3}{4} \frac{1}{4u^4} + \frac{1}{2} \frac{3}{4} \frac{5}{6} \frac{1}{6u^6} - \dots \quad (u^2 > 1.)$$

$$106. \cosh^{-1} u = \log 2u - \frac{1}{2} \frac{1}{2u^2} - \frac{1}{2} \frac{3}{4} \frac{1}{4u^4} - \frac{1}{2} \frac{3}{4} \frac{5}{6} \frac{1}{6u^6} - \dots \quad (u^2 > 1.)$$

$$107. \tanh^{-1} u = u + \frac{1}{3} u^3 + \frac{1}{5} u^5 + \frac{1}{7} u^7 + \dots \quad (u^2 < 1.)$$

$$108. \coth^{-1} u = \tanh^{-1} \frac{1}{u} = \frac{1}{u} + \frac{1}{3u^3} + \frac{1}{5u^5} + \frac{1}{7u^7} + \dots \quad (u^2 > 1.)$$

$$109. \operatorname{sech}^{-1} u = \cosh^{-1} \frac{1}{u} = \log \frac{2}{u} - \frac{1}{2} \frac{u^2}{2} - \frac{1}{2} \frac{3}{4} \frac{u^4}{4} - \frac{1}{2} \frac{3}{4} \frac{5}{6} \frac{u^6}{6} - \dots \quad (u^2 < 1.)$$

$$110. \operatorname{csch}^{-1} u = \sinh^{-1} \frac{1}{u} = \frac{1}{u} - \frac{1}{2} \frac{1}{3u^3} + \frac{1}{2} \frac{3}{4} \frac{1}{5u^5} - \frac{1}{2} \frac{3}{4} \frac{5}{6} \frac{1}{7u^7}$$

$$+ \dots \quad (u^2 > 1.)$$

$$= \log \frac{2}{u} + \frac{1}{2} \frac{u^2}{2} - \frac{1}{2} \frac{3}{4} \frac{u^4}{4} + \frac{1}{2} \frac{3}{4} \frac{5}{6} \frac{u^6}{6} - \dots \quad (u^2 < 1.)$$

E.—DERIVATIVES.

$$111. \frac{d e^u}{du} = e^u.$$

$$112. \frac{d \log_e u}{du} = \frac{1}{u}.$$

$$113. \frac{d x^u}{du} = x^u \cdot \frac{d u}{du} \cdot \log_e x.$$

$$114. \frac{d u^u}{du} = u^u (1 + \log_e u).$$

$$115. \frac{d \sinh u}{du} = \cosh u.$$

$$116. \frac{d \cosh u}{du} = \sinh u.$$

$$117. \frac{d \tanh u}{du} = \operatorname{sech}^2 u.$$

$$118. \frac{d \coth u}{du} = -\operatorname{csch}^2 u.$$

$$119. \frac{d \operatorname{sech} u}{du} = -\operatorname{sech} u \cdot \tanh u.$$

$$120. \frac{d \operatorname{csch} u}{du} = -\operatorname{csch} u \cdot \coth u.$$

$$121. \frac{d \sinh^{-1} u}{du} = \frac{1}{\sqrt{u^2 + 1}}.$$

$$122. \frac{d \cosh^{-1} u}{du} = \frac{1}{\sqrt{u^2 - 1}}.$$

$$123. \frac{d \tanh^{-1} u}{du} = \frac{1}{1 - u^2}.$$

$$124. \frac{d \coth^{-1} u}{du} = \frac{1}{1 - u^2}.$$

$$125. \frac{d \operatorname{sech}^{-1} u}{du} = \frac{-1}{u \sqrt{1 - u^2}}.$$

$$126. \frac{d \operatorname{csch}^{-1} u}{du} = \frac{-1}{u \sqrt{u^2 + 1}}.$$

$$127. \frac{d \operatorname{gd} u}{du} = \operatorname{sech} u.$$

$$128. \frac{d \operatorname{gd}^{-1} u}{du} = \sec u.$$

F.—INTEGRALS. (INTEGRATION CONSTANTS ARE OMITTED.)

$$129. \int \sinh u \, du = \cosh u.$$

$$130. \int \cosh u \, du = \sinh u.$$

$$131. \int \tanh u \, du = \log \cosh u.$$

$$132. \int \coth u \, du = \log \sinh u.$$

$$133. \int \operatorname{sech} u \, du = 2 \tan^{-1} e^u = \operatorname{gd} u.$$

$$134. \int \operatorname{csch} u \, du = \log \tanh \frac{u}{2}.$$

$$135. \int \sinh^n u \, du = \frac{1}{n} \sinh^{n-1} u \cosh u - \frac{n-1}{n} \int \sinh^{n-2} u \, du, \\ = \frac{1}{n+1} \sinh^{n+1} u \cosh u - \frac{n+2}{n+1} \int \sinh^{n+2} u \, du.$$

$$136. \int \cosh^n u \, du = \frac{1}{n} \sinh u \cosh^{n-1} u + \frac{n-1}{n} \int \cosh^{n-2} u \, du, \\ = -\frac{1}{n+1} \sinh u \cosh^{n+1} u + \frac{n+2}{n+1} \int \cosh^{n+2} u \, du.$$

$$137. \int u \sinh u \, du = u \cosh u - \sinh u.$$

$$138. \int u \cosh u \, du = u \sinh u - \cosh u.$$

$$139. \int u^2 \sinh u \, du = (n^2 + 2) \cosh u - 2u \sinh u.$$

$$140. \int u^2 \sinh u \, du = n^2 \cosh u - n n^2 - 1 \sinh u$$

$$+ n(n-1) \int u^{n-2} \sinh u \, du.$$

141. $\int \sinh^2 u \, du = \frac{1}{2} (\sinh u \cosh u - u).$
142. $\int \sinh u \cdot \cosh u \, du = \frac{1}{2} \cosh (2u).$
143. $\int \cosh^2 u \, du = \frac{1}{2} (\sinh u \cosh u + u).$
144. $\int \tanh^2 u \, du = u - \tanh u.$
145. $\int \coth^2 u \, du = u - \coth u.$
146. $\int \operatorname{sech}^2 u \, du = \tanh u.$
147. $\int \operatorname{sech}^3 u \, du = \frac{1}{2} \operatorname{sech} u \tanh u + \frac{1}{2} \operatorname{gd} u.$
148. $\int \operatorname{csch}^3 u \, du = -\coth u.$
149. $\int \sinh^{-1} u \, du = u \sinh^{-1} u - (1 + u^2)^{1/2}.$
150. $\int \cosh^{-1} u \, du = u \cosh^{-1} u - (u^2 - 1)^{1/2}.$
151. $\int \tanh^{-1} u \, du = u \tanh^{-1} u + \frac{1}{2} \log (1 - u^2).$
152. $\int u \sinh^{-1} u \, du = \frac{1}{4} \left[(2u^2 + 1) \sinh^{-1} u - u (1 + u^2)^{1/2} \right].$
153. $\int u \cosh^{-1} u \, du = \frac{1}{4} \left[(2u^2 - 1) \cosh^{-1} u - u (u^2 - 1)^{1/2} \right].$
154. $\int (\cosh a + \cosh u)^{-1} \, du = 2 \operatorname{csch} a \cdot \tanh^{-1} (\tanh \frac{1}{2} u \cdot \tanh \frac{1}{2} a),$
 $= \operatorname{csch} a \left[\log \cosh \frac{1}{2} (u + a) - \log \cosh \frac{1}{2} (u - a) \right].$
155. $\int (\cos a + \cosh u)^{-1} \, du = 2 \operatorname{csc} a \cdot \tan^{-1} (\tanh \frac{1}{2} u \cdot \tan \frac{1}{2} a).$
156. $\int (1 + \cos a \cdot \cosh u)^{-1} \, du = 2 \operatorname{csc} a \cdot \tanh^{-1} (\tanh \frac{1}{2} u \cdot \tan \frac{1}{2} a).$
157. $\int \sinh u \cos u \, du = \frac{1}{2} (\cosh u \cdot \cos u + \sinh u \cdot \sin u).$
158. $\int \cosh u \cdot \cos u \, du = \frac{1}{2} (\sinh u \cdot \cos u + \cosh u \cdot \sin u).$
159. $\int \sinh u \cdot \sin u \, du = \frac{1}{2} (\cosh u \cdot \sin u - \sinh u \cdot \cos u).$
160. $\int \cosh u \cdot \sin u \, du = \frac{1}{2} (\sinh u \cdot \sin u - \cosh u \cdot \cos u).$
161. $\int \sinh (mu) \sinh (nu) \, du$
 $= \frac{1}{m^2 - n^2} \left[m \sinh (nu) \cosh (mu) - u \cosh (nu) \sinh (mu) \right].$

$$162. \int \cosh (mu) \sinh (nu) du$$

$$= \frac{1}{m^2 - n^2} \left[m \sinh (nu) \sinh (mu) - n \cosh (nu) \cosh (mu) \right]$$

$$163. \int \cosh (mu) \cosh (nu) du$$

$$= \frac{1}{m^2 - n^2} \left[m \sinh (mu) \cosh (nu) - n \sinh (nu) \cosh (mu) \right]$$

$$164. \int \sinh u \tanh u du = \sinh u - x^d u,$$

$$165. \int \cosh u \coth u du = \cosh u + \log \tanh \frac{u}{2}.$$

$$166. \int \sec u du = \operatorname{gd}^{-1} u,$$

$$167. \int \sec^2 \phi d\phi = \int (1 + \tan^2 \phi)^{1/2} d \tan \phi = \frac{1}{2} \sec \phi \tan \phi + \frac{1}{2} \log |1 + \tan^2 \phi| \\ = \frac{1}{2} \tan \phi (1 + \tan^2 \phi)^{1/2} + \frac{1}{2} \sinh^{-1} (\tan \phi). \quad \text{Here } \phi = x^d.$$

$$168. \int \frac{du}{(u^2 + a^2)^{1/2}} = \sinh^{-1} \frac{u}{a}, \quad \int \frac{du}{(a^2 - u^2)^{1/2}} = \sin^{-1} \frac{u}{a}.$$

$$169. \int \frac{du}{(u^2 - a^2)^{1/2}} = \cosh^{-1} \frac{u}{a}, \quad \int \frac{du}{(a^2 - u^2)^{1/2}} = \cos^{-1} \frac{u}{a}.$$

$$170. \int \frac{du}{(a^2 - u^2)^{3/2}} = \frac{1}{a} \tanh^{-1} \frac{u}{a}, \quad \int \frac{du}{u^2 + a^2} = \frac{1}{a} \tan^{-1} \frac{u}{a}.$$

$$171. \int \frac{du}{(u^2 - a^2)^{3/2}} = \frac{1}{a} \coth^{-1} \frac{u}{a}, \quad \int \frac{du}{u^2 + a^2} = \frac{1}{a} \cot^{-1} \frac{u}{a}.$$

$$172. \int \frac{du}{u(a^2 - u^2)^{3/2}} = \frac{1}{a} \operatorname{sech}^{-1} \frac{u}{a}, \quad \int \frac{du}{u(u^2 - a^2)^{3/2}} = \frac{1}{a} \operatorname{cosech}^{-1} \frac{u}{a}.$$

$$173. \int \frac{du}{u(a^2 + u^2)^{3/2}} = \frac{1}{a} \operatorname{csch}^{-1} \frac{u}{a}, \quad \int \frac{du}{u(u^2 + a^2)^{3/2}} = \frac{1}{a} \operatorname{csch}^{-1} \frac{u}{a}.$$

$$174. \int \frac{du}{(au^2 + 2bu + c)^{1/2}} = \frac{1}{\sqrt{c}} \sinh^{-1} \frac{au + b}{(ac - b^2)^{1/2}}, \quad a \text{ positive, } ac > b^2 \\ = \frac{1}{\sqrt{a}} \cosh^{-1} \frac{au + b}{(b^2 - ac)^{1/2}}, \quad a \text{ positive, } ac < b^2 \\ = -\frac{1}{\sqrt{c - a}} \cos^{-1} \frac{au + b}{(b^2 - ac)^{1/2}}, \quad a \text{ negative,}$$

$$175. \int \frac{du}{(au^2 + 2bu + c)^{3/2}} = -\frac{1}{(ac - b^2)^{1/2}} \tanh^{-1} \frac{au + b}{(ac - b^2)^{1/2}}, \quad ac > b^2 \\ = \frac{-1}{(b^2 - ac)^{3/2}} \tanh^{-1} \frac{au + b}{(b^2 - ac)^{1/2}}, \quad ac < b^2, \\ = \frac{-1}{(b^2 - ac)^{3/2}} \coth^{-1} \frac{au + b}{(b^2 - ac)^{1/2}}, \quad ac < b^2, \\ = \frac{-1}{(b^2 - ac)^{3/2}} \coth^{-1} \frac{au + b}{(b^2 - ac)^{1/2}}, \quad au + b > (b^2 - ac)^{1/2}.$$

$$\begin{aligned}
 76. \int \frac{du}{(a-u)(u-b)^{1/2}} &= \frac{2}{(a-b)^{1/2}} \tanh^{-1} \sqrt{\frac{u-b}{a-b}}, \\
 &\text{or } \frac{2}{(b-a)^{1/2}} \tanh^{-1} \sqrt{\frac{u-b}{b-a}}, \\
 &\text{or } \frac{2}{(a-b)^{1/2}} \coth^{-1} \sqrt{\frac{u-b}{a-b}}. \quad (\text{The real form is to be taken.})
 \end{aligned}$$

$$\begin{aligned}
 77. \int \frac{du}{(u-a)(b-u)^{1/2}} &= \frac{2}{(b-a)^{1/2}} \tanh^{-1} \sqrt{\frac{b-u}{b-a}}, \\
 &\text{or } \frac{2}{(b-a)^{1/2}} \coth^{-1} \sqrt{\frac{b-u}{b-a}}, \\
 &\text{or } \frac{2}{(a-b)^{1/2}} \tanh^{-1} \sqrt{\frac{b-u}{a-b}}. \quad (\text{The real form is to be taken.})
 \end{aligned}$$

$$78. \int (u^2 + a^2)^{1/2} du = \frac{1}{2} u (u^2 + a^2)^{1/2} + \frac{1}{2} a^2 \cosh^{-1} \frac{u}{a}.$$

$$79. \int (a^2 - u^2)^{1/2} du = \frac{1}{2} u (a^2 - u^2)^{1/2} + \frac{1}{2} a^2 \sin^{-1} \frac{u}{a}.$$

$$80. \int (u^2 + a^2)^{3/2} du = \frac{1}{4} u (u^2 + a^2)^{3/2} + \frac{1}{2} a^2 \sinh^{-1} \frac{u}{a}.$$

$$81. \int e^{au} du = \frac{e^{au}}{a}.$$

$$82. \int u e^{au} du = \frac{e^{au}}{a^2} (au - 1).$$

$$83. \int u^m e^{au} du = \frac{u^m e^{au}}{a} - \frac{m}{a} \int u^{m-1} e^{au} du.$$

$$84. \int \frac{e^{au} du}{u^m} = \frac{1}{m-1} \left[-\frac{e^{au}}{u^{m-1}} + a \int \frac{e^{au} du}{u^{m-1}} \right],$$

$$85. \int a^{bu} du = \frac{a^{bu}}{b \log a}.$$

$$\begin{aligned}
 86. \int u^n a^u du &= \frac{a^u u^n}{\log a} - \frac{na^u u^{n-1}}{(\log a)^2} + \frac{n(n-1)a^u u^{n-2}}{(\log a)^3} - \dots \\
 &\quad + \frac{n(n-1)(n-2)}{(\log a)^{n+1}} + \dots + 2.1 \frac{a^u}{(\log a)^{n+1}}.
 \end{aligned}$$

$$\begin{aligned}
 87. \int \frac{a^u du}{u^n} &= \frac{a^u}{n-1} \left[-\frac{1}{u^{n-1}} - \frac{\log a}{(n-2)u^{n-2}} - \frac{(\log a)^2}{(n-2)(n-3)u^{n-3}} \right. \\
 &\quad \left. - \dots + \frac{(\log a)^{n-1}}{(n-2)(n-3) \dots 2.1} \int \frac{a^u du}{u} \right].
 \end{aligned}$$

$$88. \int \frac{a^u du}{u} = \log u + u \log a + \frac{(u \log a)^2}{2 \cdot 2!} + \frac{(u \log a)^3}{3 \cdot 3!} + \dots$$

$$189. \int \frac{dx}{1+e^x} = \log \frac{e^x}{1+e^x}.$$

$$190. \int \frac{dx}{a+be^{mx}} = \frac{1}{am} \left[mx - \log(a+be^{mx}) \right].$$

$$191. \int \frac{dx}{ae^{mx}+be^{-mx}} = \frac{1}{m(ab)^{\frac{1}{2}}} \tan^{-1} \left(e^{mx} \sqrt{\frac{a}{b}} \right).$$

$$192. \int \frac{dx}{(a+be^{mx})^{\frac{3}{2}}} = \frac{1}{m\sqrt{a}} \left[\log(\sqrt{a+be^{mx}} - \sqrt{a}) \right. \\ \left. - \log(\sqrt{a+be^{mx}} + \sqrt{a}) \right].$$

$$193. \int \frac{xe^x dx}{(1+x)^2} = \frac{e^x}{1+x}.$$

$$194. \int e^{ax} \log x dx = \frac{e^{ax} \log x}{a} - \frac{1}{a} \int \frac{e^{ax} dx}{x}.$$

$$195. \int \log x dx = x \log x - x.$$

$$196. \int x^m \log x dx = \frac{x^{m+1}}{m+1} \left[\frac{\log x}{m+1} - \frac{1}{(m+1)^2} \right].$$

$$197. \int (\log x)^n dx = x (\log x)^n - n \int (\log x)^{n-1} dx.$$

$$198. \int x^m (\log x)^n dx = \frac{x^{m+1} (\log x)^n}{m+1} - \frac{n}{m+1} \int x^m (\log x)^{n-1} dx.$$

$$199. \int \frac{(\log x)^n dx}{x} = \frac{(\log x)^{n+1}}{n+1}.$$

$$200. \int \frac{dx}{\log x} = \log(\log x) + \log x + \frac{(\log x)^2}{2 \cdot 2!} + \frac{(\log x)^3}{3 \cdot 3!} + \dots$$

$$201. \int \frac{dx}{(\log x)^n} = -\frac{1}{(n-1)(\log x)^{n-1}} + \frac{1}{n-1} \int \frac{dx}{(\log x)^{n-1}}.$$

$$202. \int \frac{x^m dx}{(\log x)^n} = -\frac{x^{m+1}}{(n-1)(\log x)^{n-1}} + \frac{m+1}{n-1} \int \frac{x^m dx}{(\log x)^{n-1}}.$$

$$203. \int \frac{x^m dx}{\log x} = \int \frac{e^{-y}}{y} dy, \text{ where } y = -(m+1) \log x.$$

$$204. \int \frac{dx}{x \log x} = \log(\log x).$$

$$205. \int \frac{dx}{x (\log x)^n} = -\frac{1}{(n-1)(\log x)^{n-1}}.$$

$$206. \int (a+bx)^n \log x dx = \\ \frac{1}{b(m+1)} \left[(a+bx)^{m+1} \log x - \int \frac{(a+bx)^{m+1} dx}{x} \right].$$

207. $\int_a^b u^n \log (a + bu) du = \frac{1}{n+1} \left[u^{n+1} \log (a + bu) - b \int_a^b \frac{u^{n+1} du}{a + bu} \right].$
208. $\int_a^b \log (a + bu) du = \log a \cdot \log u + \frac{bu}{a} - \frac{1}{2^2} \left(\frac{bu}{a} \right)^2 + \frac{1}{3^2} \left(\frac{bu}{a} \right)^3 - \dots,$
 $-\frac{1}{2} (\log bu)^2 + \frac{a}{bu} + \frac{1}{2^2} \left(\frac{a}{bu} \right)^2 - \frac{1}{3^2} \left(\frac{a}{bu} \right)^3 + \dots,$
209. $\int_a^b \frac{\log u du}{(a + bu)^n} = \frac{1}{b(n-1)} \left[-\frac{\log u}{(a + bu)^{n-1}} + \int_a^b \frac{du}{u(a + bu)^{n-1}} \right].$
210. $\int_a^b \frac{\log u du}{a + bu} = \frac{1}{b} \log u \cdot \log (a + bu) - \frac{1}{b} \int_a^b \frac{\log (a + bu)}{u} du.$
211. $\int_a^b (a + bu) \log u du = \frac{(a + bu)^2}{2b} \log u - \frac{a^2 \log u}{2b} - au + \frac{1}{2} bu^2.$
212. $\int_a^b \frac{\log u du}{(a + bu)^2} = \frac{2}{b} \left[(\log u - 2) \frac{1}{(a + bu)} + \frac{1}{a} \log (1/a + bu + 1/a) \right.
 $\left. - \frac{1}{a} \log (1/a + bu - 1/a) \right], \text{ if } a > 0,$
 $= \frac{2}{b} \left[(\log u - 2) \frac{1}{(a + bu)} + 2 \frac{1}{a} \tan^{-1} \sqrt{\frac{a + bu}{-a}} \right], \text{ if } a < 0.$$
213. $\int_0^\infty e^{-au^2} du = \frac{1}{2a} \pi = \frac{1}{2a} \Gamma\left(\frac{1}{2}\right).$
214. $\int_0^\infty u^s e^{-au} du = \Gamma\left(\frac{s+1}{a}\right) = \frac{s!}{a^{s+1}}.$
215. $\int_0^\infty u^{2s} e^{-au^2} du = \frac{1 \cdot 3 \cdot 5 \dots (2s-1)}{2^{s+1} a^s} \sqrt{\frac{\pi}{a}}.$
216. $\int_0^\infty e^{-u^2} \frac{u^3}{a} du = \frac{e^{-\frac{2a}{a^2}}}{2} \sqrt{\frac{\pi}{a}}, \quad a > 0.$
217. $\int_0^\infty e^{-au^2} \frac{1}{u} du = \frac{1}{2a} \sqrt{\frac{\pi}{a}}.$
218. $\int_0^\infty \frac{e^{-nu}}{1+n} du = \sqrt{\frac{\pi}{n}}, \quad n > 0.$
219. $\int_0^\infty \frac{du}{\sinh (nu)} = \frac{\pi}{2n}.$
220. $\int_0^\infty \frac{u du}{\sinh (nu)} = \frac{\pi^2}{4n^2}.$

$$221. \int_0^{2\pi} \sinh(mu) \cdot \sinh(nu) du = \int_0^{2\pi} \cosh(mu) \cdot \cosh(nu) du \\ = 0, \text{ if } m \text{ is different from } n,$$

$$222. \int_0^{2\pi} \cosh^2(mu) du = \int_0^{2\pi} \sinh^2(mu) du = \frac{2\pi}{2}.$$

$$223. \int_{-i\pi}^{+i\pi} \sinh(mu) du = 0.$$

$$224. \int_0^{2\pi} \cosh(mu) du = 0.$$

$$225. \int_{-i\pi}^{2\pi} \sinh(mu) \cosh(nu) du = 0.$$

$$226. \int_0^{2\pi} \sinh(mu) \cosh(nu) du = 0.$$

$$227. \int_0^1 \frac{\log u}{1-u} du = -\frac{\pi^2}{6}.$$

$$228. \int_0^1 \frac{\log u}{1+u} du = -\frac{\pi^2}{12}.$$

$$229. \int_0^1 \frac{\log u}{1-u^2} du = -\frac{\pi^2}{8}.$$

$$230. \int_0^1 \log\left(\frac{1+u}{1-u}\right) \cdot \frac{du}{u} = \frac{\pi^2}{4}.$$

$$231. \int_0^1 \frac{\log u du}{(1-u^2)^{\frac{1}{2}}} = -\frac{\pi}{2} \log 2.$$

$$232. \int_0^1 \frac{(u^p - u^q) du}{\log u} = \log \frac{p+1}{q+1}, \text{ if } p+1 > 0, q+1 > 0.$$

$$233. \int_0^1 (\log u)^n du = (-1)^n \cdot n!.$$

$$234. \int_0^1 \left(\log \frac{1}{u}\right)^{\frac{1}{2}} du = \frac{1}{2} \sqrt{\pi}.$$

$$235. \int_0^1 \left(\log \frac{1}{u}\right)^n du = n!.$$

$$236. \int_0^1 \frac{du}{\left(\log \frac{1}{u}\right)^{\frac{1}{2}}} = \sqrt{\pi}.$$

$$237. \int_0^1 u^m \log\left(\frac{1}{u}\right)^n du = \frac{\Gamma(n+1)}{(m+1)^{n+1}}, \text{ if } m+1 > 0, n+1 > 0.$$

$$238. \int_0^1 \log\left(\frac{e^u+1}{e^u-1}\right) du = \frac{\pi^2}{4}.$$

G.—FORMULAS FOR THE SOLUTION OF PSEUDO-SPHERICAL TRIANGLES.

a.—*Right Triangles.*

$$\sin A : \frac{\cot B (a)}{\cot B (c)} :: \sinh a$$

$$\cos A : \frac{\cos B (b)}{\cos B (c)} :: \tanh b$$

$$\cos A : \frac{\sin B}{\sin B (a)} :: \sin B \cosh a.$$

$$\cot A : \frac{\cot B (b)}{\cos B (a)} :: \sinh b$$

$$\cos B : \frac{\cos B (a)}{\cos B (c)} :: \tanh a$$

$$\cos B : \frac{\sin A}{\sin B (b)} :: \sin A \cosh b.$$

$$\sin B : \frac{\cot B (b)}{\cot B (c)} :: \sinh b$$

$$\cot B : \frac{\cot B (a)}{\cos B (b)} :: \sinh a$$

$$\tan A \tan B :: \sin B (c) :: \sin B (a) \sin B (b), \\ :: \operatorname{sech} c :: \operatorname{sech} a \operatorname{sech} b.$$

b.—*Oblique Triangles.*

The general relations are:

$$\cosh a :: \cosh b \cosh c :: \sinh b \sinh c \cos A,$$

$$\sin A \sinh b :: \sin B \sinh a,$$

$$\cosh a \sinh b :: \cosh b \cos C :: \sin C \cot A,$$

$$\cos A :: \cos B \cos C :: \sin B \sin C \cosh a.$$

PARTI solves the six typical cases in the following manner:

CASE 1.—Given a, b, c . Put $2p :: a + b + c$. Then,

$$\tan \frac{1}{2} A :: \sqrt{\frac{\sinh (p-b) \sinh (p-c)}{\sinh p \sinh (p-a)}}.$$

The conditions are $a < b + c$; $b < a + c$; and $c < a + b$.

CASE 2.—Given a, b, A . Draw the geodesic line CD perpendicular to AB .

Then $a > CD$; $\frac{\sinh b \sin A}{\sinh a} < 1$; $\cot \frac{1}{2} C > 0$; and $\tanh \frac{1}{2} c > 0$.

$$\sin B = \frac{\sinh b \sin A}{\sinh a}$$

$$\cos \frac{1}{2} C = \frac{\tan \frac{1}{2} (A - B) \sinh \frac{1}{2} (a + b)}{\sinh \frac{1}{2} (a - b)}$$

$$\tanh \frac{1}{2} c = \frac{\tanh \frac{1}{2} (a - b) \sin \frac{1}{2} (A + B)}{\sin \frac{1}{2} (A - B)}$$

CASE 3.—Given a, b, C , $a + b + c = (A + B + C)$.

$$\tan \frac{1}{2} (A + B) = \cot \frac{1}{2} C \frac{\cosh \frac{1}{2} (a - b)}{\cosh \frac{1}{2} (a + b)}$$

$$\tan \frac{1}{2} (A - B) = \cot \frac{1}{2} C \frac{\sinh \frac{1}{2} (a - b)}{\sinh \frac{1}{2} (a + b)}$$

$$\tanh \frac{1}{2} c = \sqrt{\frac{\sin \Delta \sin (\Delta + C)}{\sin (\Delta + A) \sin (\Delta + B)}}$$

CASE 4.—Given A, B, c , $A + B + c = \pi$ and $DBC = DBC'$. The angle DBA is the angle between the geodesic DB drawn perpendicular to AC' and the geodesic BG drawn parallel to AC .

$$\tanh \frac{1}{2} (a + b) = \tanh \frac{1}{2} c \frac{\cos \frac{1}{2} (A - B)}{\cos \frac{1}{2} (A + B)}$$

$$\tanh \frac{1}{2} (a - b) = \tanh \frac{1}{2} c \frac{\sin \frac{1}{2} (A - B)}{\sin \frac{1}{2} (A + B)}$$

$$\tan \frac{1}{2} C = \sqrt{\frac{\sinh (\rho - a) \sinh (\rho - b)}{\sinh \rho \sinh (\rho - c)}}$$

CASE 5.—Given A, B, a , $a + CD$ and $A + B + c = \pi$.

Solve the two right triangles formed by the geodesic line CD drawn perpendicular to AB .

CASE 6.—Given A, B, C , $A + B + C = \pi$.

$$\tanh \frac{1}{2} a = \sqrt{\frac{\sin \Delta \sin (\Delta + A)}{\sin (\Delta + B) \sin (\Delta + C)}}$$

II.—FORMULAS FOR THE SOLUTION OF THE CUBIC.

If a cubic equation is given in the form

$$x^3 + ax^2 + bx + c = 0,$$

it can be reduced by the substitution $x = y - \frac{a}{3}$ to the simpler form

$$x^3 + px + q = 0.$$

¹Taken from Des Ingenieurs Taschenbuch der Hütte, Berlin, 18th edition.

CASE 1.—When $x^3 + \rho x \pm q = 0$; ρ and q positive. Compute the auxiliary variable u from $\sinh u = \frac{\frac{1}{2}q}{\frac{1}{2}\rho (\frac{1}{2}\rho)^{1/2}}$; then the roots are

$$x_1 = \mp 2 \sqrt{\frac{1}{2}\rho} \sinh \frac{1}{2} u,$$

$$x_2 = \pm \sqrt{\frac{1}{2}\rho} \sinh \frac{1}{2} u + i \sqrt{\rho} \cosh \frac{1}{2} u,$$

$$x_3 = \pm \sqrt{\frac{1}{2}\rho} \sinh \frac{1}{2} u - i \sqrt{\rho} \cosh \frac{1}{2} u.$$

CASE 2.—When $x^3 - \rho x \pm q = 0$; ρ and q positive. $(\frac{1}{2}\rho)^2 < (\frac{1}{2}q)^2$. Compute u from $\cosh u = \frac{\frac{1}{2}q}{\frac{1}{2}\rho (\frac{1}{2}\rho)^{1/2}}$; then the roots are

$$x_1 = \mp 2 \sqrt{\frac{1}{2}\rho} \cosh \frac{1}{2} u,$$

$$x_2 = \pm \sqrt{\frac{1}{2}\rho} \cosh \frac{1}{2} u + i \sqrt{\rho} \sinh \frac{1}{2} u,$$

$$x_3 = \pm \sqrt{\frac{1}{2}\rho} \cosh \frac{1}{2} u - i \sqrt{\rho} \sinh \frac{1}{2} u.$$

CASE 3.—When $x^3 - \rho x \pm q = 0$; ρ and q positive. $(\frac{1}{2}\rho)^2 > (\frac{1}{2}q)^2$. Compute the angle u from $\cos u = \frac{\frac{1}{2}q}{\frac{1}{2}\rho (\frac{1}{2}\rho)^{1/2}}$; then the roots are

$$x_1 = \mp 2 \sqrt{\frac{1}{2}\rho} \cos \frac{1}{2} u,$$

$$x_2 = \mp 2 \sqrt{\frac{1}{2}\rho} \cos (\frac{1}{2} u + 120^\circ),$$

$$x_3 = \mp 2 \sqrt{\frac{1}{2}\rho} \cos (\frac{1}{2} u + 240^\circ).$$

CASE 4.—When $x^3 - \rho x \pm q = 0$; ρ and q positive. $(\frac{1}{2}\rho)^2 = (\frac{1}{2}q)^2$.

$$x_1 = \mp 2 \sqrt{\frac{1}{2}\rho},$$

$$x_2 = x_3 = \pm \sqrt{\frac{1}{2}\rho}.$$

For applications of hyperbolic and circular functions to the solution of the cubic whose coefficients are general (*i. e.*, real or complex), see a brief paper by Mr. W. D. Lambert in *American Mathematical Monthly* for April, 1906.

GEOMETRICAL ILLUSTRATIONS OF HYPERBOLIC FUNCTIONS.

The algebraic relationship of the hyperbolic functions to the circular functions has been discussed in the section on definitions and formulas. A close relationship also exists between the elliptic functions and the hyperbolic functions. Thus it may be shown that the elliptic integral of the first kind,

$$u = \int \frac{d\phi}{\sqrt{1 - k^2 \sin^2 \phi}},$$

in which k is the modulus and ϕ the amplitude, reduces to $u = g\phi^{-1} \phi$ when $k = 1$. The elliptic functions thus degenerate into the hyperbolic functions when the modulus is equal to unity. A case in point is the elastica, the equation of which takes the form of an elliptic integral, excepting when the modulus is unity. It then reduces to the two equations

$$\frac{x}{a} = u - z \tanh u; \quad \frac{y}{a} = \frac{z}{\cosh u},$$

which is a syntactrix described by the free end of a rod whose middle point traces out the tractory.¹

Ligowski gives the following easy geometrical method of demonstrating the relations between the hyperbolic and circular functions. Let the equation of the circle of unit radius be

$$x^2 + y^2 = 1,$$

and call u_c the arc of this circle from the positive x axis to the point x_c, y_c .

Then, of course, the circle may be represented by the two equations

$$x_c = \cos u_c; \quad y_c = \sin u_c.$$

Now, the area of the circular sector, whose

chord is $2y_c$, is $\frac{2 \cdot u_c \cdot 1}{2} = u_c$, so that x_c and

y_c may be regarded as the cosine and sine of a sector u_c . The ellipse may be derived from the unit circle by multiplying the ordinates y_c by b . Hence, in the ellipse, the area of the sector subtended by the chord $2y_c$ is, say, u_e and $u_c = bu_e$.

¹ If in these equations u is substituted for z they represent any syntactrix. The two equations, with this substitution, can be combined to the following:

$$\frac{(au - \pi)^2}{a^2 M^2} + \frac{y^2}{a^2 M^2} = 1,$$

showing that the curve is traced by a point on a circle of radius au whose center is in motion. It is noteworthy that if in this equation the hyperbolic sector u is replaced by a circular sector ϕ , the new equation represents a prolate or a curvate cycloid, or better the synycloid. Thus the syntactrix may be considered as a synycloid with an infinite period.

Thus

$$x_0 = \cos u_0 = \cos \frac{u_0}{\delta},$$

$$y_0 = \sin u_0 = \frac{y_0}{\delta} = \sin \frac{u_0}{\delta},$$

so that for the ellipse,

$$x^2 + \frac{y^2}{\delta^2} = 1,$$

$$x_0 = x_0 = \cos \frac{u_0}{\delta}; \quad y_0 = \delta \sin \frac{u_0}{\delta}.$$

The equation

$$x^2 - y^2 = 1$$

represents an equilateral hyperbola, and if u is the area of the hyperbolic sector whose chord is $2y$, then there can be no objection to writing

$$x = \cosh u; \quad y = \sinh u,$$

where \cosh and \sinh are functions whose nature is still to be determined. The most evident relation is

$$\cosh^2 u - \sinh^2 u = 1.$$

Now if $i = \sqrt{-1}$, the hyperbola may be written

$$x^2 + \frac{y^2}{i^2} = 1,$$

which is an ellipse whose major axis is unity and whose minor axis is i . Comparing this with the ellipse discussed above, it appears at once that

$$x = \cosh u = \cos \frac{u}{i},$$

$$y = \sinh u = i \sin \frac{u}{i},$$

or, in an equivalent form,

$$\cosh u = \cos iu; \quad \sinh u = -i \sin iu,$$

$$\cosh iu = \cos u; \quad \sinh iu = i \sin u.$$

The investigation of $\cosh u$ and $\sinh u$ can be completed in various ways; for example, by writing out the series for $\cos iu$ and $-i \sin iu$ and showing that their sum or difference is $e^{\pm u}$.

The geometrical properties of the hyperbolic functions themselves are commonly discussed in reference to the equilateral hyperbola. They could also be derived from the geometry of the ellipse without reference to the hyperbola; but a more perspicuous method seems to be to study the relations of these functions to both curves at the same time.¹

In any ellipse,

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1,$$

¹ See Bull. Geol. Soc. Am., vol. 2, 1891, p. 49, and Am. Jour. Sci., vol. 46, 1893, p. 337.

the area $\alpha\beta$ may be chosen as the unit area, so that the equation of the curve becomes

$$a^2 x^2 + \frac{y^2}{a^2} = 1.$$

By varying the value of a in this equation a family of ellipses is obtained each of area π , all with the same center and all with axes lying in the axes of coordinates. The envelope of this system of curves is the hyperbola $xy = \frac{1}{2}$, and this may be conceived as generated by the motion of a single point. The coordinates of the point P_1 , at which the hyperbola is tangent to the ellipse, are

$$x_1 = \frac{1}{\sqrt{2}a} \quad y_1 = \frac{a}{\sqrt{2}};$$

and the coordinates of the point c at which the hyperbola is tangent to the unit circle, are

$$x = y = \frac{1}{\sqrt{2}}.$$

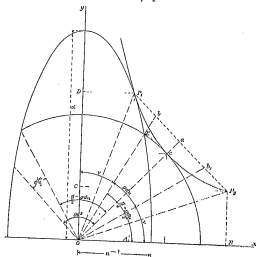


FIG. 5.

If the hyperbola is conceived as generated by the point c in moving from its original position to P_1 (or as a "line of flow"), its radius vector sweeps over an hyperbolic sector ocP_1 . If this area is called $\frac{\pi}{2}$, then by a well-known formula,

$$ds = x dy - y dx,$$

and because $xy = \frac{1}{2}$,

$$du = \frac{1}{2} \left(\frac{dy}{y} - \frac{dx}{x} \right).$$

Since no integration constant is required,

$$u = -\frac{1}{2} \log \frac{y_1}{x_1} = -\frac{1}{2} \log \alpha^2 \text{ or } \alpha = e^u.$$

The area w is the sector $OP_1'OP_2'$, where the coördinates of P_1' are $x_1 = \pm p_1$ and $y_1 = \pm x_1$. It is noteworthy that two other areas, $AP_1'OP_2'R$ and $CDP_1'OP_2'$ have this same value, for evidently

$$\int_{x_1}^{x_2} y \, dx = \int_{y_1}^{y_2} x \, dy = \log \alpha = w.$$

The length of the chord $P_1'P_2'$ is

$$P_1'P_2' = (x_1 - x_2)^2 + (y_1 - y_2)^2 = 4\alpha^2 - 4,$$

and half of this, or $P_1'O$, is the hyperbolic sine which may evidently be put in the form

$$\sinh u = \frac{e^u - e^{-u}}{2}.$$

Since the curve $P_1'OP_2'$ is an hyperbola,

$$x^2 y^2 = x^2 p_1^2 = 1,$$

and therefore

$$x^2 y^2 = 1 - \sinh^2 u = \frac{e^u + e^{-u}}{2} = \cosh u,$$

The diameters connecting the points of intersection of the unit circle and the ellipse whose axes are a and a^{-1} , may be called the isocyclic diameters of the ellipse, because the circle and the ellipse have the same area. These diameters are not conjugate. If the ellipse is conceived as the section on the greatest and least axes of an ellipsoid of unit volume, the isocyclic diameters are the traces of the circular sections of the ellipsoid. The coördinates of one of the points of intersection, say P_1 , are

$$x = \frac{1}{\sqrt{a^2 + 1}}, \quad y = \frac{a}{\sqrt{a^2 + 1}},$$

and therefore the angle r , which the vector OP_1 makes with the major axis of the ellipse, is given by the relation

$$\tan r = a^{-1} = e^{-u},$$

and it follows that

$$\tan \left(\frac{\pi}{2} - 2r \right) = \frac{1}{2} (\cot r - \tan r) = \sinh u.$$

This angle $\left(\frac{\pi}{2} - 2r \right)$ is u , or the gudermannian of u , so that in any

ellipse whatever the angle made by any line parallel to one isocyclic diameter with a perpendicular on the other isocyclic diameter is the gudermannian of the natural logarithm of the semi-major axis, this being expressed in terms of the isocyclic radius, which in the general case is the square root of the product of the semiaxes.¹ In the diagram the gudermannian $\delta\phi_1$ is shown as bisected by the axis of the hyperbola, and it is worth remarking that if the ellipse were to be distorted into a circle by compressing the major axis and elongating the minor axis, the line od would be brought into coincidence with ob_1 , so that $gd\ n$ can be defined as the angle through which an isocyclic diameter has swept when the ellipse has been derived from a circle by irrational plane strain.

The angle $45^\circ + \frac{gd\ n}{2}$ which occurs in the formula for meridional parts is the angle made by either isocyclic diameter of the ellipse with the minor axis, and the tangent of this angle is the semi-major axis a .

The twofold relations of the hyperbolic functions to the hyperbola and the ellipse are illustrated in a somewhat different manner in figure 6.

Here the curve $\phi_1 c \phi_2$ is an arc of an hyperbola $y^2 = x^2 - 1$. If the area of the sector $o \phi_1 c \phi_2$ is called n , $a \phi_1 = \sinh n$ and $oc = \cosh n$. Make $bc = \phi_2 a$ and draw the associated ellipse shown in the diagram. Then the angle $boc = gd\ n$; $bo = \cosh n$ and

$$\begin{aligned}\tan gd\ n &= \sinh n \\ \sec gd\ n &= \cosh n \\ \sin gd\ n &= \tanh n.\end{aligned}$$

The ellipse has corresponding properties. Since the gudermannian is the angle between either isocyclic diameter and a line perpendicular to the other, the line od may be regarded as coinciding with one isocyclic diameter and the axis of abscissas with the other. The major axis of the ellipse then bisects

¹The isocyclic diameter used in this illustration of hyperbolic functions lies in the circular section of a shear ellipsoid, or an ellipsoid in which the mean axis is a mean proportional between the greatest and least axes. The position of the circular section of the general ellipsoid is also readily expressed in terms of hyperbolic functions. Let the equation of the ellipsoid be

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1; \quad a > b > c.$$

$$\text{If } \frac{b}{c} = \cosh u_1 \text{ and } \frac{a}{b} = \cosh u_2,$$

the angle ν which the circular section makes with the greatest axis is given by

$$\tan \nu = \frac{1}{c} \tanh \nu = \frac{b^{-1} - a^{-1}}{c^{-1} - a^{-1} - b^{-1}} = \frac{\tanh u_1}{\sinh u_2}.$$

If $u_2 = u_1$ and $\frac{a}{b} = e$ this expression reduces to $\tan \nu = e^{-1}$, or to the case of the shear ellipsoid.

the angle $90^\circ - g'du$, its magnitude is $2e'$, and the equation of the ellipse is

$$x^2 + 4xy \tan g'du + y^2 (4 \tan^2 g'du + 1) = 1.$$

By varying the value of $\tan g'du$ (or $\sinh u$) a system of ellipses is obtained whose envelopes are $y = \pm 1$, so that if any one of the ellipses is supposed to be derived from the circle by distortion, the process is that generally known as "shearing motion or scission."

If the points in the circle are sought which correspond to the points on the

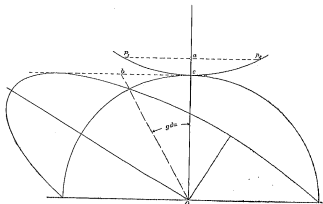


FIG. 6.

major axis of the ellipsoid, it will be found that the angle between the two positions (the angle of rotation) is equal to the gudermannian.¹

If instead of the horizontal, the vertical line in figure 6 had been taken as coinciding with the isocyclic diameter of the ellipse, the result would have been the discovery of a system of ellipses whose envelopes are $x = \pm 1$, similar in all respects excepting orientation to that discussed.

¹Love's *Treatise on the Theory of Elasticity*, vol. 1, p. 43.

METHODS OF INTERPOLATION.

It is not easy to describe the use of the tables which follow without a notes on the methods of interpolation with reference to which they are arranged. In all of them the argument advances by equal increments, equal, say, to ω . It is required to find a value of the function F interpolate between two tabulated values, F_0 and F_1 , corresponding to a fractional value of the argument or to $n\omega$, where n is always less than unity, preferably less than one-half.

Let F_n be the value of the function to be determined; let F_{-1} and F_{-2} be tabulated values of F immediately preceding F_0 , and let F_1 , F_2 be values immediately following F_0 . Denote $F_1 - F_0$ by a_1 , other first differences being similarly represented. If also $a_2 - a_1 = b_1$, $b_2 - b_1 = c_1$, etc., the whole system of functions and differences is shown in the following schedule:

F	Δ	Δ^2	Δ^3	Δ^4	Δ^5	Δ^6
F_{-2}		b''		d''		f''
F_{-1}	a''	b'	c''	d'	e''	f'
F_0	a'	b_0	c'	d_0	e'	f_0
F_1	a_1	b_1	c_1	d_1	e_1	f_1
F_2	a_2	b_2	c_2	d_2	e_2	f_2

The most familiar formula of interpolation is due to Newton, and in the above notation it may be written thus:

$$F_n - F_0 = na_1 + \frac{n(n-1)}{2!} b_1 + \frac{n(n-1)(n-2)}{3!} c_1 + \frac{n(n-1)(n-2)(n-3)}{4!} d_1 + \dots$$

¹The notation and general outline of treatment here presented closely follow Herbert L. Rice's treatise, *Theory and Practice of Interpolation*, 1899. The Nichols Press, Lynn, Massachusetts.

The coefficients are those of the binomial theorem. This formula is applicable to the first intervals of a series, which is not the case with any other mode of interpolation. It may also be adapted to the last intervals by substituting $-n$ for n and a', b', c', d', \dots for a, b, c, d, \dots . In systematic interpolation, such as is involved in the construction of tables, it is usual to employ the more rapidly converging formulas of Stirling or Bessel; but when a computing machine and a table of products are available it is sometimes less laborious to compute an extra term of Newton's formula than to calculate and apply the mean differences called for by the other methods. Both Stirling's and Bessel's formulas can be derived from Newton's by known relations between the several differences.

In Stirling's formula the mean of the first differences next preceding and following F_0 is made use of instead of only the latter, as in Newton's formula. The third differences are similarly treated, so that a_0, c_0 , etc., being new quantities, are defined by

$$a'_0 + a_0 = a_0; \quad c'_0 + c_0 = c_0, \text{ etc.}$$

These mean values are used in conjunction with the even differences on the same horizontal line with F_0 in the schedule, and Stirling's formula is

$$F_n = F_0 + na_0 + \frac{n^2}{2!} b_0 + \frac{n(n^2-1)}{3!} c_0 + \frac{n^2(n^2-1)}{4!} d_0 \\ + \frac{n(n^2-1)(n^2-4)}{5!} e_0 + \dots$$

To interpolate backward it is only needful to substitute $-n$ for n .

In Bessel's formula use is made of mean differences of the even orders, and if b, d , etc., are these means they are defined in terms of the scheduled differences, thus:

$$b_0 + b_1 = b; \quad d_0 + d_1 = d, \text{ etc.}$$

They are used in conjunction with the simple odd differences a_1, c_1 , etc., and the formula is

$$F_n = F_0 + na_1 + \frac{n(n-1)}{2!} b + \frac{n(n-1)(n-\frac{1}{2})}{3!} c_1 + \frac{(n-1)n(n-1)(n-2)}{4!} d \\ + \frac{(n-1)n(n-1)(n-2)(n-\frac{1}{2})}{5!} e_1 + \dots$$

When $n = \frac{1}{2}$, or for interpolation to the middle of an interval, the coefficient of e_1 vanishes and $F_n = F_0$ is independent of third differences, which is clearly a great advantage. In general this method is very advantageous when n approaches one-half, while Stirling's formula is preferred for small values of n .

When Bessel's formula is used for backward interpolation, it may be written

$$F_{-n} - F_0 = -na' + \frac{n(n-1)}{2!} \left(\frac{\delta_0 + \delta'}{2} \right) - \frac{n(n-1)(n-2)}{3!} c' + \dots,$$

n being taken as positive.

A distinct method of interpolation is founded directly upon Taylor's theorem. If F'_1, F''_2 , etc., are the successive derivatives of F_0 , and u is the constant increment of the argument, this fundamental theorem may be written

$$F_u - F_0 = u F'_0 + \frac{u^2}{2!} F''_0 + \frac{u^3}{3!} F'''_0 + \frac{u^4}{4!} F^{(4)}_0 + \dots \quad (\alpha),$$

and this becomes an interpolation formula when the derivatives are expressed in terms of the differences. This is readily accomplished to any degree of exactness whenever the differences become rigorously or sensibly constant at some particular order and the tabular interval is small relatively to the period of the function. To find the numerical values of the derivatives it is not necessary that the analytical expression of the function should be known; for, rearranging the terms of the formula of Bessel and Stirling according to ascending powers of u and comparing coefficients,

(Bessel.)	(Stirling.)
$F'_0 = \frac{1}{u} (\delta_1 - \frac{1}{2} \delta + \frac{1}{12} \delta_3 + \frac{1}{12} \delta' - \frac{1}{120} \delta_5 + \dots)$	$= \frac{1}{u} (\delta_0 - \frac{1}{2} \delta_2 + \frac{1}{16} \delta_4 - \dots)$
$F''_0 = \frac{1}{u^2} (\delta - \frac{1}{2} \delta_2 - \frac{1}{12} \delta' + \frac{1}{24} \delta_3 + \dots)$	$= \frac{1}{u^2} (\delta_0 - \frac{1}{12} \delta_2 + \dots)$
$F'''_0 = \frac{1}{u^3} (\delta_1 - \frac{1}{2} \delta' + 0 \dots)$	$= \frac{1}{u^3} (\delta_0 - \frac{1}{2} \delta_2 + \dots)$
$F^{(4)}_0 = \frac{1}{u^4} (\delta' - \frac{1}{2} \delta_3 + \dots)$	$= \frac{1}{u^4} (\delta_0 - \dots)$
$F^{(5)}_0 = \frac{1}{u^5} (\delta_1 - \dots)$	$= \frac{1}{u^5} (\delta_0 - \dots)$

Hence, to compute the first derivative, say from Stirling's formula, when the 6th differences and $\frac{1}{16}$ of the mean of the corresponding third differences are negligible, it is only needful to take the mean of the first differences preceding and following the tabular value of the function, subtract from it one-sixth ($\frac{1}{6}$) of the mean of the corresponding third differences, and divide the result by u .

Newton's formula gives for arguments near the beginning of the series of tabular values:

$$\begin{aligned} F'_0 &= \frac{1}{u} (\delta_1 - \frac{1}{2} \delta_1 + \frac{1}{2} \delta_2 - \frac{1}{2} \delta_3 + \frac{1}{2} \delta_4 - \dots) \\ F''_0 &= \frac{1}{u^2} (\delta_2 - \delta_1 + \frac{1}{12} \delta_3 - \frac{1}{2} \delta_4 + \dots) \\ F'''_0 &= \frac{1}{u^3} (\delta_3 - \frac{3}{2} \delta_2 + \frac{1}{2} \delta_4 - \dots) \end{aligned}$$

In the tables which follow, the first derivatives multiplied by ω are tabulated in units of the last decimal place of the tabulated function (except Table VII), and the remaining quantities required in the computation can be found by mere inspection. The higher order of differences will be needed only for a very few arguments at the beginning or end of those tabular values whose numerical magnitudes approach 0 or ∞ . For the remaining arguments it will be found that the $\frac{1}{16}$ part of the second difference of $\omega F'_0$ is not great enough to influence the result, and it is therefore sufficient to use

$$\left. \begin{aligned} F_n &= F_0 + n \omega (F'_0 + \frac{n}{2} \alpha_0) \\ F_{-n} &= F_0 - n \omega (F'_0 - \frac{n}{2} \alpha_0) \end{aligned} \right\} \dots \dots \dots (b),$$

$\omega \alpha_0$ being the mean first difference of $\omega F'$ corresponding to F_0 . This formula is rigorous when third differences are zero. In most cases $\frac{n \omega \alpha_0}{2}$ can be found mentally, and since $\omega (F'_0 + \frac{n}{2} \alpha_0)$ is here to be regarded as an interpolated value of $\omega F'_0$, no confusion can arise as to the sign of the correction. It thus becomes almost as easy to include $\omega \alpha_0$ in the computation as to omit it. A convenient rule is: Find by linear interpolation the value $\omega F'$ for one-half the interval ($\frac{n}{2}$); multiply this interpolated value by the entire interval (n) and apply the product to the tabular value of the function, either positively or negatively, according as the function is increasing or decreasing. To illustrate the application of this rule, find $\log_{10} \sinh 0.00304$. In this case $n = 0.4$ and the table gives

$$F_0 = 7.47712; \omega F'_0 = 1447.7; \omega \alpha_0 = -48.3,$$

the last two quantities being expressed in units of the fifth decimal place. Interpolating $\omega F'$ linearly for one-half the interval,

$$\omega F'_0 = \omega (F'_0 + \frac{n}{2} \alpha_0) = 1447.7 - 0.2 \times 48.3 = 1438.0;$$

multiplying this value by n and adding the result to the tabular value of the function, there results

$$F_n = 1438.0 \times 0.4 + 7.47712 = 7.48287.$$

The corresponding difference formula (Bessel's) is

$$F_n = F_0 + n \left[a_1 - \frac{(1-n)}{2} \delta \right].$$

The derivative formula (b) with two terms has the advantage of being much more convenient than the difference formula, while the accuracy of the two is the same (five-eighths of a unit) when the derivatives are tabulated to the

same order of decimal as the function. In the case of linear interpolation, however, it is in general more accurate to use the differences, the maximum error of the difference formula being one-half of a unit and that of the derivative formula three-fourths of a unit in the next succeeding decimal place. The accuracy of the two formulas is the same when the next succeeding decimal of the derivative is tabulated. The error of the derivative formula is then simply the error of the tabular value, while the error of the difference formula may be =, > or < than that of the tabular value, but is never greater than one-half of a unit.

Interpolation formulas which are applicable only to a single function are rarely advantageous, because as much time is often consumed in looking them up as is saved by employing them; but some formulas applicable to hyperbolic functions are so simple that when once suggested they can hardly be forgotten. Thus, Taylor's theorem gives at once

$$\cosh (n + n\omega) = \cosh n + n \omega \sinh n + \frac{n^2 \omega^2}{2!} \cosh n + \frac{n^3 \omega^3}{3!} \sinh n + \dots,$$

and the form for the sine is of course similar. Again, when, as here, the cosine is tabulated with an argument in terms of radians,

$$\cos (n + n\omega) = \cos n - n \omega \sin n - \frac{n^2 \omega^2}{2!} \cos n + \frac{n^3 \omega^3}{3!} \sin n + \dots,$$

the series for the sine being similar.

So, too,

$$\begin{aligned} \log_e (n + n\omega) - \log_e n &= \log_e \left(1 + \frac{n\omega}{n} \right) \\ &= \frac{n\omega}{n} - \frac{1}{2} \frac{n^2 \omega^2}{n^2} + \frac{1}{3} \frac{n^3 \omega^3}{n^3} - \frac{1}{4} \frac{n^4 \omega^4}{n^4} + \dots \quad \left(\frac{n\omega}{n} < 1. \right) \end{aligned}$$

Simplest of all is the exponential,

$$\begin{aligned} e^{n + n\omega} = e^n (e^{n\omega} - 1) &= e^n \left(n\omega + \frac{n^2 \omega^2}{2!} + \frac{n^3 \omega^3}{3!} + \dots \right) \dots (c), \\ &= e^n (+0.01n + 0.000,05n^2 + 0.000,000,167n^3 + \dots), (n = 0.01) \\ &= e^n (+0.001n + 0.000,000,5n^2 + \dots). \quad (n = 0.001) \end{aligned}$$

The series in $n\omega$ may be replaced by k , and this may have any finite value. Especially when a computing machine is available, this formula is easily applied and is, of course, rigorous.

From time to time inverse interpolation by a method more accurate than first differences is called for; indeed, whenever interpolation of a function by higher differences is needful, it is equally needful that the argument corresponding to a given function should be ascertained by a like process. The method ordinarily pursued in such cases is to estimate two values of the argument, one a little greater and the other a little less than that of the required argument, interpolate corresponding values of the function, and finally interpolate linearly over the reduced interval for a final value of the argument.

Another method consists in interpolating values of the function and its derivatives for an approximate value of the required interval and then computing a correction to this approximate value by means of a reversed Taylor's series.¹

If second differences only are to be taken into account, the usual method of procedure is to estimate an approximate value of x , say x' , and with this estimated value we interpolate linearly as before and find the value of $\omega F_{\frac{x'}{2}}$

corresponding to one-half of the estimated interval $\left(\frac{x'}{2}\right)$. Then the required interval (x) is equal to the difference between the given value and the nearest tabular of the function divided by $\omega F_{\frac{x'}{2}}$. This method is in fact simply the reverse of the one for direct interpolation. A recomputation is of course necessary if the values of x and x' are not practically the same. As an illustration, find x when $\log_{10} \sinh x = 7.48287$. We first compute

$$x' = \frac{7.48287 - 7.47712}{1448.0} = 0.4,$$

then the value of $\omega F_{\frac{x'}{2}}$ in terms of the last tabular unit is found as before

by linear interpolation to be 1438.0. Hence

$$x = \frac{7.48287 - 7.47712}{1438.0} = 0.40 \text{ and } x = 0.00304.$$

Since the estimated and computed values of the interval agree, there is no need of a recomputation.

The methods which are based upon an estimated value of the argument are unsystematic and clumsy. It is much better to use a formula which gives the required result by a direct and rigorous method. To find such a formula, divide Taylor's series (eq. a) by $\omega F_0'$, and put

$$a_1 = \frac{F_0 - F_0'}{\omega F_0'}; f_1 = \frac{\omega^2 F_0''}{2 \omega F_0'}; f_2 = \frac{\omega^3 F_0'''}{6 \omega F_0'}; f_3 = \frac{\omega^4 F_0^{(4)}}{24 \omega F_0'}; f_4 = \frac{\omega^5 F_0^{(5)}}{120 \omega F_0'};$$

then the interpolation formula may be written

$$u_1 = x + f_1 x^2 + f_2 x^3 + f_3 x^4 + f_4 x^5.$$

Reversing this series in accordance with the relation,²

$$\begin{aligned} x &= \frac{y}{a_0} + \frac{y^2}{a_0^2} (-a_1) + \frac{y^3}{a_0^3} (-a_2 a_0 + 2 a_1^2) \\ &\quad + \frac{y^4}{a_0^4} (-a_3^2 a_0 + 5 a_2 a_1 a_0 - 5 a_1^3) \\ &\quad + \frac{y^5}{a_0^5} (-a_4^3 a_0 + 3 a_3^2 (a_1^2 + 2 a_2 a_0) - 21 a_2 a_1^2 a_0 + 14 a_1^4), \end{aligned}$$

¹ Rice's Theory and Practice of Interpolation, section 83.

² Prof. James McMahon: "On the General Term in the Reversion of Series." Bull. Am. Math. Soc., April, 1894.

which is the reversed series of

$$y = a_0 x + a_1 x^2 + a_2 x^3 + a_3 x^4 + a_4 x^5;$$

and rearranging the terms,¹

$$\begin{aligned} n = n_1 + n_1 [-n_1 f_1 + 2 (n_1 f_1)^2 - 5 (n_1 f_1)^3 + 14 (n_1 f_1)^4 + \dots] \\ + n_1^2 [n_1 f_1 (-1 + 5 (n_1 f_1) - 21 (n_1 f_1)^2 + \dots)] \\ + n_1^3 [n_1 f_1 (-1 + 6 n_1 f_1) + 3 (n_1 f_1)^2 + \dots] \\ + n_1^4 [-n_1 f_1 + \dots] \quad \dots \quad (d). \end{aligned}$$

In the actual computation it is convenient to put

$$r = \frac{n_1}{2 \omega F'_0};$$

then, when successive values of $\omega F'_0$ are tabulated in units of the last decimal place, and Stirling's coefficients are used,

$$\begin{aligned} n_1 f_1 &= r \omega (a_0 - \tfrac{1}{2} \gamma_0) & n_1 f_2 &= \tfrac{1}{2} r \omega (\beta_0 - \tfrac{1}{2} \gamma_0) \\ n_1 f_3 &= \tfrac{1}{2} r \omega \gamma_0 & n_1 f_4 &= \tfrac{1}{6} r \omega \delta_0. \end{aligned}$$

The formula is rigorous inclusive of fifth differences, and does not require the computation of an approximate value of n . It is applicable to any function or series of tabulated values whose successive derivatives become evanescent. It is particularly convenient when differences higher than the second are neglected. The formula then becomes

$$n = n_1 + n_1 [-r \omega a_0 + 2 (r \omega a_0)^2 - 5 (r \omega a_0)^3 + 14 (r \omega a_0)^4].$$

Since $r \omega a_0$ is a very small quantity, the higher powers are seldom needed, and, should they be required, are easily taken into account. As an example, let it be required to find n when $\log_{10} \sinh n = 7.48287$. We compute

$$\begin{aligned} n_1 &= \frac{7.48287 - 7.47712}{1447.7} = 0.40 \\ r &= \frac{n_1}{2 \omega F'_0} = \frac{0.40}{2 \times 1447.7} = 0.0001; \end{aligned}$$

and

$$n_1 r \omega a_0 = 0.40 \times 0.0001 \times (-48.3) = 0.00.$$

Hence $n = n_1 = 0.40$ and $n = 0.00304$, the same as obtained by the other method.

When $F'_0 = x^w$, it is easily shown, either by means of series (d) or by independent methods, that

$$\begin{aligned} n \omega &= \log (1 + n_1 \omega) \quad \dots \quad (e), \\ n &= + n_1 - 0.005 n_1^2 + 0.000,033 n_1^3 + \dots \quad (\omega = 0.01) \\ n &= + n_1 - 0.0005 n_1^2 + \dots \quad (\omega = 0.001) \end{aligned}$$

These formulæ afford an easy means of finding the natural logarithm of a

¹ See, also, "Inverse Interpolation by Means of a Reversed Series," Phil. Mag., May, 1908.

number from the tabular values of e^x . Thus, to find the natural logarithm of 0.9642102, we compute

$$x_1 = \frac{0.9646403 - 0.9642102}{0.0009646403} = 0.4457.$$

Substituting in the last of the above equations

$$x = 0.44587 - 0.0005 \times (0.15)^2 = 0.44577,$$

hence $\text{nat log of } 0.9642102 = -0.0364458$.

One of the most important applications of differences is the detection of errors in values tabulated at equal intervals of the argument. It may be shown by substitution in the schedule of differences (page xxiv) that an error, $+e$, in f_0 produces errors in the successive differences of any order which are multiples of e , the law of distribution of the multiples being that of the corresponding coefficients of the binomial theorem, and the signs of the errors being alternately positive and negative. Since some order of differences of every continuous function must vanish, the presence of an error in a tabular value must ultimately result in producing successive differences of a certain order which alternate in sign. A comparison of these differences with the corresponding binomial coefficients enables one to estimate the magnitude of the error. Thus in the series which follows:

x	x^2	x^3	x^4	x^5	x^6
13	2197				
14	2744	547			
15	3375	631	84		
16	4096	721	96	6	± 2
17	4915	819	98	8	3
18	5832	917	98	6	± 12
19	6859	1027	110	12	3
20	8000	1141	114	4	± 2
21	9261	1261	120	6	

the alternation in sign occurs in the fourth-order differences, and the numerical values are twice the coefficients of $(a+b)^4$. Hence there is an error of ± 2 units in the value 4915. The corrections $-2, +8, -12, +8, -2$ applied to the fourth differences causes them to vanish, and the corrections $-2, +6, -6, +2$ applied to the third differences reduces them to a constant.

This method is particularly useful in detecting large accidental errors in a series of observed values and in estimating their magnitudes.

DESCRIPTION OF TABLES.

Table I is devoted to 5-place values of the logarithmic hyperbolic sine, cosine, tangent, and cotangent of w expressed in radians. The argument w advances by ten-thousandths from 0 to 0.1, by thousandths from 0.1 to 3.0, and by hundredths from 3.0 to 6.0. In this as in all the tables (except Table VII), instead of the first differences, the first derivatives of the functions multiplied by the tabular interval (ω) are tabulated in units of the last decimal place, under the heading " $\omega N'_2$ ". As noted above, this agrees with much of the most authoritative modern practice and facilitates interpolation. It did not appear worth while to extend the tabulation of the table beyond six radians, because higher values are seldom needed; but in Table IV a few very high values of $e^{\pm w}$ are given, from which in case of need the hyperbolic functions can be found.

In Table II the natural values of the hyperbolic functions are tabulated for the same arguments as in Table I. In some instances the values are given to one or to two places of decimals more than would be obtained by taking the inverse logarithms of the preceding table.

Table III gives $\sin x = -i \sinh ix$ and $\cos x = \cosh ix$ with their logarithms to 5 decimal places, the argument x being expressed in radians. The tabulation extends from $x = 0.0000$ to 0.1000, and from $x = 0.100$ to 1.600, because $90^\circ = 1.5707963$ radians; so that, this value of $\frac{\pi}{2}$ being borne in mind, the table affords the means of finding the sine or cosine of any arc expressed in radians.

Independently of hyperbolic functions, this table is often convenient. It also facilitates the computation of the principal hyperbolic functions of complex variables. Thus

$$\sinh (u \pm iv) = \sinh u \cos v \pm i \cosh u \sin v,$$

$$\cosh (u \pm iv) = \cosh u \cos v \pm i \sinh u \sin v,$$

and to compute either of these functions it is only needful to take out two tabulated logarithms from Table III, two from Table I, make two additions, and look out two antilogarithms. It is of course conceivable that all the four quantities involved should be tabulated once for all; but even if u and v advanced only by hundredths, such a table would occupy 200 pages. To find from it functions corresponding to u and v expressed in thousandths would require three interpolations—a process quite as laborious as the use of the tables here given.

Space which would otherwise be vacant is utilized to give the angular values of the radian arguments, or a table of conversion of radians from

0.0000 to 0.1000 and from 0.100 to 1.600 into degrees, minutes, seconds, and hundredths of a second.

Table IV gives the values of $\log_e e^x$, e^x and e^{-x} to 7 decimal places from $x = 0.000$ to 3.000 and from 3.00 to 6.00. The values of e^x and e^{-x} enter into a vast number of equations representing natural phenomena, especially those (as Cornuot remarked) which can be classed under the generic denomination of phenomena of absorption or gradual extinction. The ascending and descending exponentials may be regarded at will either as hyperbolic functions or as independent components of hyperbolic functions, since

$$e^{\pm x} = \cosh x \pm \sinh x$$

while, on the other hand,

$$\sinh x = \frac{e^x - e^{-x}}{2}; \quad \cosh x = \frac{e^x + e^{-x}}{2};$$

$$\tanh x = \frac{e^x - e^{-x}}{e^x + e^{-x}}; \quad \log x = 2 \tan^{-1} e^x \cdot \frac{x}{2}.$$

It is further evident that a table of e^{-x} is a table of natural antilogarithms. Formula *c* on page xli affords an easy means of obtaining the natural logarithm of a number from the tabular values of e^{-x} . It is of course unnecessary to give the derivative of e^x , since this is e^x , while the derivative of e^{-x} is $-e^{-x}$. In general the interpolation or extrapolation of the function is very easy. (See formula *c*, page xxxix). The logarithm of e^{-x} is not given because, being merely the arithmetical complement of the $\log_e e^x$, it can be read off as fast as it can be written down.

In any table of $\log_e e^x$ where the interval of x is ω , the difference of successive logarithms is constant and equal to $\omega \log_e e$ or 0.4342 9448 ω . If the logarithm of $e^{x+\omega}$ is required, this will be

$$(x + \omega) \log_e e = \log_e e^x + \omega \log_e e.$$

Hence it is practicable to prepare an extended table of proportional parts or a table of $\omega \log_e e$ which is applicable to any table of $\log_e e^x$ when the tabulated values are multiplied by ω . Such an auxiliary table is given at the close of Table IV, in which the argument $\frac{x}{\omega}$ varies from 0.000 to 0.500. If

ω is unity, this is merely a 5-place table of $\log_e e^x$. If, on the other hand, ω is 0.001, as in the earlier part of Table IV, the auxiliary table gives the increments corresponding to x to 8 places of decimals. Thus, if $\log_{10} e^{0.00025}$ is required, Table IV gives $\log_{10} e^{0.00025} = 0.0382179$, the auxiliary table gives for $\frac{x}{\omega} = 0.245$, $\omega \log_e e = 0.10640$; and since $\omega = 0.001$, $\omega \log_{10} e = 1$

0.00010640, which added to $\log_{10} e^{0.00025}$ gives $\log_{10} e^{0.000255} = 0.0383243$. In the latter portion of Table IV ω is only 0.01; so that, if the $\log_{10} e^{0.0045}$ is wanted, the main table gives $\log e^{0.0045} = 1.3028834$, and ω times $\omega \log e$ is 0.0010640; so that the required number is 1.3039474.

When $\log_e e^x$ is required for $x > 6.00$ the auxiliary table is insufficient to give 7-place values. Then the main table, IV, may be used as an auxiliary table. Thus

$$\begin{aligned}\log e^{11.088285} &= \log e^{11} + \log e^{0.088285} \\ &= 4.7772393 + 0.0383243 = 4.8155636.\end{aligned}$$

In the second part of Table IV values of $e^{x/n}$ and the logarithms of e^n are given, n varying from 1 to 100. The logarithms are given to 10 decimals; the other functions to 9 significant figures. Such high values are seldom needed, but are included here lest these tables might some times fail the computer.

Table V gives the natural logarithms of numbers from 1 to 1000, with their derivatives to 5 places of decimals. These derivatives are merely the reciprocals of the arguments, and since $\log_e \left(\frac{1}{y}\right) = -\log_e y$, the logarithms

of the derivatives are the tabulated logarithms taken negatively. The table thus gives, in addition to the logarithms of 1000 whole numbers, the logarithms of 1000 proper fractions lying between 0.001 and unity.

The interpolation of natural logarithms is much less simple than is that of common logarithms, and this is the main reason why the latter are preferred for computation. A few simple rules, however, facilitate the needful calculations. When the natural logarithm of a vulgar fraction is required it is best to look out the logarithm of both numerator and denominator and subtract. If the natural logarithm is required of a fractional number stated decimally and less than 21.000, no attempt should be made to interpolate it directly, because the third differences of the table cannot be neglected for numbers so near the beginning of the table. If the number lies between 10.000 and 21.000, as, for example, 12.345, it should be written 123.45/10, and the required logarithm will be $\text{nat log } 123.45 - \text{nat log } 10$. It is safe to interpolate the first of these between $\text{nat log } 123$ and $\text{nat log } 124$, using the formula for second differences. If the number whose logarithm is to be found lies between 1 and 10, as, for example, 8.2468, it should be written 824.68/100, so that the required quantity is $\text{nat log } 824.68 - \text{nat log } 100$. The first of these logarithms can be found by using only the mean first differences or the tabulated derivatives between the logarithms of 824 and 825. For values of the argument between 21 and 158 interpolation requires the use of second differences, while above 158 average first differences or the first derivative is sufficiently accurate, inasmuch as the error involved is less than half a unit in the fifth decimal place.

It would be possible to interpolate the negative logarithms of the smaller fractions given by the derivatives—that is, from the reciprocal of 159 on to the end of the table, or for numbers between 0.00628 and 0.00100—but this would not be expedient, because these reciprocals are themselves rounded values. If the natural logarithm of 0.0068352 is wanted as accurately as

the tables will give it, it is best to find the logarithm of 683.52 and to subtract from it the logarithm of 100,000. (See also formula ϵ , page xli.)

The use of second differences may be avoided altogether if the computer chooses, for any number not lying between 158 and 1,000 may be multiplied and divided by another number which will bring the numerator within these limits. Thus, if, as before, nat log 12.345 is required, this number may be written $246.90/20$, and the natural logarithm of the numerator found by help of the derivative, less nat log 20, is the required value.

The awkwardness of a table of natural logarithms is inherent and cannot be overcome by any device. It depends on the fact that e and the base of numeration, the number 10, are incommensurable quantities. If our numeration were duodecimal, as it might have been had six fingers to a hand been the rule instead of the exception, 12 would also have been the most convenient base for a table of logarithms. A great table of natural logarithms, such as Barlow's 8-place table of all numbers from 1 to 10,000, is only a little more convenient than that here offered, and with it, too, it is expedient to multiply any small number by a factor such that the product approaches 10,000.

Table VI gives the values of the gudermannian of x to 7 places from $x = 0.000$ to $x = 3.000$ and from $x = 3.00$ to $x = 6.00$. In this table x is expressed in radians, and $gd\ x$ both in radians and in angular measure. For theoretical work the gudermannian in radians is usually the more convenient, but for use in finding hyperbolic functions it must be reduced to an angle.

The gudermannian, $gd\ x$, is connected with the hyperbolic functions by the following well-known relations:

$$\sinh x = \tan gd\ x; \quad \cosh x = \sec gd\ x; \quad \tanh x = \sin gd\ x$$

$$\tanh \frac{x}{2} = \tan \frac{1}{2} gd\ x; \quad x = \log_e \tan \left(\frac{\pi}{4} + \frac{1}{2} gd\ x \right).$$

Thus Table VI, with the help of a 7-place table of logarithms of the circular functions, gives 7-place values of the hyperbolic functions.

The derivative of $gd\ x$ is $\operatorname{sech} x$, and can be used independently of the gudermannian.

Table VII is substantially a reversion of Table VI, and gives the anti-gudermannian in terms of the gudermannian, both, however, being expressed in minutes and decimals of a minute. If x is the anti-gudermannian expressed in minutes and x the same function expressed in radians,

$$x = 3437.7468\ x = 3437.7468 \log_e \tan \left(\frac{\pi}{4} + \frac{1}{2} gd\ x \right).$$

Table VII is a table of x , and if x is multiplied by 0.000 2908 8821 the product is x in radians. This table is known to navigators as a table of Meridional Parts for a Spherical Globe. It is frequently of use in the discussion of physical questions and is the very foundation of navigation with Mercator charts. In the more modern works on navigation, however, the

ellipticity of the meridian is allowed for in computing tables of meridional parts, and consequently this table will probably never be reproduced in a navigator. For this reason it is here preserved for computers who are not engaged in navigation.

To test this table, which is borrowed from Inman, 200 of the values, or one in every 27 entries, were compared with Gudermann's 7-decimal place table of the antilogudermannian in radian measure. In nearly all cases Inman's last figure was confirmed, but in a few instances the last figure is incorrect by a unit. Inquiry into these cases showed that the maximum error detected was less than 0.006 of a minute. Thus the last figure is not absolutely trustworthy, but is near enough to enable the computer to interpolate accurately to 5 places. If 7 places of the antilogudermannian are required, they can be found by inverse interpolation in Table VI.

The earlier part of Table VII may be interpolated by first differences without considerable error. At about $84^{\circ}30'$ one-eighth of the second difference becomes approximately half a unit in the last tabulated place, and beyond this point second differences should be taken into account.

Table VIII is a table for converting radians into angular measure and *vice versa*. A few numerical constants are appended.

HISTORICAL NOTE.

The first and most important application of the functions now known as hyperbolic was made by Gerhard Mercator (Kremer) when he issued his map on "Mercator's projection," in 1569, or, as some say, in 1550, while Bowditch gives the date as 1566. To this day substantially all of the deep-sea navigation of the world is carried on by the help of this projection, which has been modified only to the extent of correcting the "meridional parts" for the ellipticity of the meridian. Mercator's problem was to find a projection on which the loxodrome should be a straight line. The solution is unique, and for a spherical globe is $\lambda = g' \frac{m}{a}$ where λ is the latitude, m the "meridional part," or the ordinate on the projection of a point in latitude λ , and a is the radius of the sphere. Of course, this relation gives

$$\frac{m}{a} = \log_e \tan \left(\frac{\pi}{4} + \frac{\lambda}{2} \right)$$

and this Mercator must have tabulated. He published his map without explanation, however, and it was left to Edward Wright in 1599 to state the formula for m .

"The actual inventor of the hyperbolic trigonometry," says Professor McMahon, "was Vincenzo Riccati, S. J. (*Opuscula ad res Phys. et Math. pertinens*, Bononiae, 1737). He adopted the notation $Sh. \phi$, $Ch. \phi$, for the hyperbolic functions and $Sc. \phi$, $Cc. \phi$ for the circular ones. He proved the addition theorem geometrically, and derived a construction for the solution of a cubic equation. Soon after Daviet de Foncenex showed how to interchange circular and hyperbolic functions by the use of $\sqrt{-1}$, and gave the analogue of de Moivre's theorem, the work resting more on analogy, however, than on clear definition (*Reflex. sur les quant. imag.*, Miscel. Turin Soc., Tom. 1). Johann Heinrich Lambert systematized the subject and gave the serial developments and the exponential expressions. He adopted the notation $\sinh u$, etc., and introduced the transcendent angle, now called the gudermannian, using it in computation and in the construction of tables."

C. Gudermann published an important memoir on Potential or Cyclic-hyperbolic functions in 1830¹, followed by extended tables. In recogni-

¹ James McMahon, *Hyperbolic Functions*, p. 71.

² Crelle's Journal, vols. 6, 7, 8, and 9. These memoirs were afterwards reprinted in a separate volume.

tion of his contributions to the subject, Cayley, in 1862,¹ proposed the name *gudermannian*² for the angle which Lambert called transcendental, and which had been variously designated by others. Among other more recent works on hyperbolic functions are Siegmund Günther's *Lehre von den Hyperbelfunctionen*, 1881, and Mr. James McMahon's *Hyperbolic Functions*, 4th edition, 1906.

The first large table of hyperbolic functions we have met with is Legendre's table of $\log \tan \left(\frac{\pi}{4} + \frac{\lambda}{2} \right)$ to 12 decimals. The argument advances

by increments of 30 minutes, but five differences are tabulated to facilitate interpolation.³ Gudermann in 1831 published a table of the same function, using centesimal degrees and advancing by hundredths of a degree ($0^{\circ}0'32''\cdot4$) from 0 to an entire quadrant, the function being given to seven decimal places. This was later supplemented by a table advancing by hundredths of a degree from 88° to 100° , the function being given to eleven decimal places. Gudermann also gave a 9-place table of $\log \cosh u$, $\log \sinh u$, and $\log \tanh u$, from $u = 2.000$ to $u = 5.000$, and a 10-place table of the same functions from $u = 5.00$ to $u = 12.00$.

In 1862 Z. P. W. Gromn⁴ published a 5-place table of hyperbolic functions, the argument being the gudermannian $gd\ u$ in sexagesimal degrees and minutes. He tabulated to this argument $\log \cosh u$, $\log \sinh u$, and the

Briggs logarithm of $\left(\frac{u}{4} + \frac{gd\ u}{2} \right)$ instead of the natural logarithms of this function, following therein a suggestion of Lambert.

In 1890 W. Ligowski issued his *Tafeln der Hyperbelfunctionen und der Kreisfunctionen*, which is admirably accurate and much the most useful collection of tables of the hyperbolic functions hitherto printed. He filled the gap left by Gudermann by computing $\log \sinh u$, $\log \cosh u$, and $\log \tanh u$ from $u = 0.000$ to 2.000. These he gives to only 5 places, but in addition he tabulates $gd\ u$ in degrees, minutes, seconds, and decimals of a second. These values are in all cases sufficiently accurate to enable the computer to take out from an ordinary table of logarithms 7-place values of the logarithms of $\cosh u$, $\sinh u$, and $\tanh u$. The argument ranges from 0.000 to 2.000 and from 2.00 to 6.00 for $gd\ u$, while $\log \cosh u$ and $\log \sinh u$ are carried up to $u = 9.00$. Ligowski also gives the natural functions $\cosh u$, $\sinh u$, $\cos u$, and $\sin u$ to 6 decimals for values of u in radians from 0.00 to 2.00, the $\cosh u$ and $\sinh u$ being continued to $u = 8.00$. The only fault we can find with Ligowski's tables is that the increments of the argument are sometimes inconveniently large.

¹ Phil. Mag., vol. 24, p. 19.

² Thus spelled in Cayley's paper.

³ *Exercices de Cal. Int.*, vol. 2, 1816.

⁴ *Neueste Schriften der Naturforscher-Gesellschaft in Danzig*, vol. 6, 1862.

In 1883 F. W. Newman published a 12-place table¹ of the descending exponential from $x=0.000$ to $x=15.349$, and a 14-place table of the same function advancing by two-thousandths from 15.350 to 17.298 and by five-thousandths from 17.298 to 27.635. In the same volume appeared Mr. J. W. L. Glaisher's tables of the ascending and descending exponential to nine significant figures, with 10-place logarithms. The argument advances by one-thousandth to 0.1; by one-hundredth to 2.00; by one-tenth to 10, and by a single unit to 500.

Mr. A. Forti's *Nuove Tavole delle Funzioni Iperboliche* were published in 1892. The hyperbolic sines, cosines, and tangents, together with their logarithms, are given to six decimals from 0.0000 to 0.2000, from 0.200 to 2.000, and from 2.00 to 8.00. Frequent errors, however, of one, two, and three units in the last decimal place practically limit these tables to five places. The gudermannian is tabulated in degrees, minutes, seconds, and tenths of a second, and the logarithms of the arguments are given to seven places.

In the volume here presented the first thousand values of $\log \sinh x$, $\log \cosh x$, and $\log \tanh x$ have been computed; the remaining values have been taken from the tables of Gudermann or Ligowski. The values of the natural hyperbolic sines and cosines for values of the argument < 0.1 and of the tangents for arguments > 2.0 have been computed; the remaining values have been taken from the tables of Forti and Ligowski. A recomputation of a great number of the borrowed values was made in order to obtain the required accuracy. The values of $\coth x$ and $\log \coth x$ have been computed.

In Table III the sines and cosines were obtained by interpolation from the 7-place values of natural sines and cosines given in Hülse's Vega, where the argument is expressed in angle. The logarithms of the sines and cosines and the angular equivalents of the arguments have been computed.

In Table IV the values of e^{-x} are all taken from Newman's great table. Those of e^{+x} from 0.000 to 0.100 and from 1 to 100 are from Glaisher's table. The remainder we computed, checking the results by Glaisher's table or by reciprocating. It should be noted that the 7-place table of e^x given in Hülse's edition of Vega is inaccurate and really amounts to no more than a 5-place table. The logarithms of e^x were computed independently of the values of e^x .

Tables V and VIII are borrowed.

The values of $gd\ x$ in Table VI in terms of angle are taken from Ligowski, excepting the thousand values between $x=2.000$ and 3.000. These were interpolated from Ligowski's values (2.00 to 3.00) with due checks on his accuracy. In preparing the table of $gd\ x$ in radians it was necessary for us to make an independent computation of this function from $x=0.300$ to $x=3.000$ in order to secure accuracy in the seventh significant figure. The remaining values were derived from Ligowski by converting angles

¹ Cambridge Phil. Soc., Trans., vol. 13, 1883.

into radians. A considerable number of his values, however, were tested by independent computation.

Table VII is borrowed from the Nautical tables of James Inman, revised by James W. Inman, London, 1867, with a few small corrections.

Finally, it may be remarked that the derivatives as given in these tables have been computed for them. They are not derived from the differences of the values as printed, but from more extended values, or are computed independently, and the error of the derivatives as well as of the functions is less than one-half of a unit in the next succeeding decimal place.

These tables were prepared in connection with the geophysical work of the United States Geological Survey, and are published with the permission of the Director.

GEORGE F. BECKER,

C. E. VAN OSTRAND,

WASHINGTON, D. C., *January, 1908.*

Following are some references to recent publications containing hyperbolic and exponential functions:

Pernot, F. E. *Abridged Tables of Hyperbolic Functions.* University of California Publications in Mathematics. Vol. I. No. 7. pp. 163-169, Feb. 16, 1915.

Seven place values of $\log_{10} \frac{\sinh u}{u}$ and $\log_{10} \cosh u$ are given at intervals of 0.005 from 0.000 to 6.000 together with first derivatives and the mean of their first differences.

Van Ostrand, C. E. *Tables of the Exponential Function and of the Circular Sine and Cosine to Radian Argument.* National Academy of Sciences, Vol. XIV, Fifth Memoir, pp. 1-79. Washington, 1921.

Values of $\frac{1}{x^2}$, $e^{1/x}$, $e^{-1/x}$, $\frac{32\pi x}{365}$, $\sin x$, and $\cos x$ are given at various intervals of argument ranging from 1×10^{-10} to 1. The argument for some of the tables extends to 100. The tabular values contain from 23 to 108 decimals or significant figures.

Hayashi Keiichi. *Elfstellige Tafeln der Kreis- und Hyperbelfunktionen sowie der Funktionen e^x und e^{-x} mit den Natürlichen Zahlen als Argument.* 182 pages. Berlin and Leipzig, 1921.

Values of $\sin u$, $\cos u$, $\tan u$, $\sinh u$, $\cosh u$, $\tanh u$, and e^u are tabulated to 5, and e^{-u} to 7 places of decimals at intervals of 0.0001 from 0.0000 to 0.1000; at intervals of 0.001 from 0.100 to 3.000; at intervals of 0.01 from 3.00 to 6.30; and at intervals of 0.1 from 6.3 to 10.0. Angular equivalents of the argument are given to 0.01 of a second. Extended values of $e^{1/x}$ are tabulated at decimal intervals from 0.0001 to 1 and at intervals of 1 from 1 to 100.

Kennelly, A. E. Tables of Sines, Cosines, Tangents, Cosecants, Secants, and Cotangents of Real and Complex Hyperbolic Angles, pp. 1-28. Reprinted in 1912 by Harvard Engineering Journal Office, Harvard University, Cambridge, Mass., from Harvard Engineering Journal, Vol. II, No. 2, May, 1903, and Vol. X, No. 4, January, 1912.

Values of the six hyperbolic functions are tabulated at intervals of 0.01 from 0.00 to 2.49 and at intervals of 0.1 from 2.5 to 7.5. Sinh x and cosh x are given to 6 decimals from 0.00 to 2.00; to 5 decimals from 2.01 to 5.00; and to 4 decimals from 5.1 to 7.5. Tanh x is given to 5 decimals, and the remaining functions are given to either 3, 4 or 5 decimals.

Kennelly, A. E. Tables of Complex Hyperbolic and Circular Functions, 246 pages. Harvard University Press, Cambridge, Mass. Second revised edition, 1921.

The preceding table is included in this volume, and in addition values of $\frac{e^x}{2}$ and $\log \frac{e^x}{2}$ are tabulated respectively to 3 and 7 places of decimals at intervals of 0.01 from 4.00 to 10.00.

C. E. VAN ORSTRAND.

WASHINGTON, D. C., May, 1924.

TABLE I

LOGARITHMS OF HYPERBOLIC FUNCTIONS

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
0.0000	— 50	— 50	0.00000	0.00000	— 50	— 50	— 50
.0001	6.00000	43430.4	.00000	.00000	6.00000	43430.4	4.00000
.0002	.30103	21745.2	.00000	.00000	.30103	21745.2	2.00000
.0003	.47712	14070.5	.00000	.00000	.47712	14070.5	1.00000
.0004	.60206	10857.4	.00000	.00000	.60206	10857.4	.69094
0.0005	6.69897	8885.0	0.00000	0.00000	6.69897	8885.0	1.00000
.0006	.77815	7238.2	.00000	.00000	.77815	7238.2	.79186
.0007	.84510	6004.2	.00000	.00000	.84510	6004.2	.65321
.0008	.90309	5148.7	.00000	.00000	.90309	5148.7	.55900
.0009	.95241	4528.5	.00000	.00000	.95241	4528.5	.49156
0.0010	7.00000	4343.0	0.00000	0.00000	7.00000	4343.0	1.00000
.0011	— 0.130	3648.1	.00000	.00000	— 0.130	3648.1	.79284
.0012	.07098	3040.1	.00000	.00000	.07098	3040.1	.65485
.0013	.11201	2510.7	.00000	.00000	.11201	2510.7	.55966
.0014	.14913	2103.1	.00000	.00000	.14913	2103.1	.49187
0.0015	7.17669	2895.1	0.00000	0.00000	7.17669	2895.1	1.00000
.0016	.20412	1714.3	.00000	.00000	.20412	1714.3	.79383
.0017	.23915	1455.2	.00000	.00000	.23915	1455.2	.65495
.0018	.26847	1214.7	.00000	.00000	.26847	1214.7	.55971
.0019	.29375	1085.8	.00000	.00000	.29375	1085.8	.49195
0.0020	7.30403	2171.5	0.00000	0.00000	7.30403	2171.5	1.00000
.0021	.32220	2068.1	.00000	.00000	.32220	2068.1	.79574
.0022	.34242	1956.1	.00000	.00000	.34242	1956.1	.65578
.0023	.35673	1888.2	.00000	.00000	.35673	1888.2	.55987
.0024	.36801	1803.0	.00000	.00000	.36801	1803.0	.49202
0.0025	7.39794	1737.2	0.00000	0.00000	7.39794	1737.2	1.00000
.0026	.41497	1670.1	.00000	.00000	.41497	1670.1	.79691
.0027	.43116	1608.5	.00000	.00000	.43116	1608.5	.65695
.0028	.44716	1551.1	.00000	.00000	.44716	1551.1	.55994
.0029	.46290	1497.0	.00000	.00000	.46290	1497.0	.49300
0.0030	7.47712	1407.7	0.00000	0.00000	7.47712	1407.7	1.00000
.0031	.49136	1361.0	.00000	.00000	.49136	1361.0	.79704
.0032	.50615	1317.4	.00000	.00000	.50615	1317.4	.65708
.0033	.51851	1276.0	.00000	.00000	.51851	1276.0	.55999
.0034	.52948	1237.3	.00000	.00000	.52948	1237.3	.49308
0.0035	7.54407	1200.8	0.00000	0.00000	7.54407	1200.8	1.00000
.0036	.55130	1166.4	.00000	.00000	.55130	1166.4	.79809
.0037	.56600	1123.8	.00000	.00000	.56600	1123.8	.65713
.0038	.57976	1083.0	.00000	.00000	.57976	1083.0	.55999
.0039	.59267	1043.0	.00000	.00000	.59267	1043.0	.49314
0.0040	7.60306	1085.7	0.00000	0.00000	7.60306	1085.7	1.00000
.0041	.61279	1038.3	.00000	.00000	.61279	1038.3	.79909
.0042	.62625	994.0	.00000	.00000	.62625	994.0	.65717
.0043	.63347	950.0	.00000	.00000	.63347	950.0	.55999
.0044	.64145	907.0	.00000	.00000	.64145	907.0	.49318
0.0045	7.65321	868.1	0.00000	0.00000	7.65321	868.1	1.00000
.0046	.65276	816.1	.00000	.00000	.65276	816.1	.79999
.0047	.66210	772.0	.00000	.00000	.66210	772.0	.65721
.0048	.66812	729.8	.00000	.00000	.66812	729.8	.55999
.0049	.67020	689.3	.00000	.00000	.67020	689.3	.49321
0.0050	7.69897	652.6	0.00000	0.00000	7.69897	652.6	1.00000
.0051	.67815	604.2	.00000	.00000	.67815	604.2	.79999
.0052	.68415	560.4	.00000	.00000	.68415	560.4	.65725
.0053	.68815	519.0	.00000	.00000	.68815	519.0	.55999
.0054	.69115	479.0	.00000	.00000	.69115	479.0	.49325

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
0.0050	7.69897	868.6	0.00001	0.0	7.69897	868.6	2.30103
.0051	.70757	851.6	.00001		.70757	851.5	.30113
.0052	.71601	835.2	.00001		.71600	835.2	.28100
.0053	.72428	819.4	.00001		.72427	819.4	.27573
.0054	.73240	804.3	.00001		.73239	804.2	.26911
0.0055	7.74036	789.6	0.00001	0.0	7.74036	789.6	2.25911
.0056	.74819	775.5	.00001		.74818	775.5	.25182
.0057	.75588	761.9	.00001		.75587	761.9	.24413
.0058	.76343	748.8	.00001		.76342	748.8	.23698
.0059	.77085	736.1	.00001		.77085	736.1	.22945
0.0060	7.77815	723.8	0.00001	0.0	7.77815	723.8	2.22185
.0061	.78533	711.0	.00001		.78532	711.0	.21408
.0062	.79239	700.5	.00001		.79239	700.5	.20701
.0063	.79934	689.9	.00001		.79933	689.9	.20057
.0064	.80618	679.6	.00001		.80617	679.6	.19381
0.0065	7.81292	668.1	0.00001	0.0	7.81291	668.1	2.18709
.0066	.81955	658.0	.00001		.81954	658.0	.18046
.0067	.82608	648.2	.00001		.82607	648.2	.17390
.0068	.83251	638.7	.00001		.83250	638.6	.16750
.0069	.83885	629.4	.00001		.83884	629.4	.16116
0.0070	7.84510	620.4	0.00001	0.0	7.84509	620.4	2.15491
.0071	.85126	611.7	.00001		.85125	611.7	.14975
.0072	.85734	603.2	.00001		.85733	603.2	.14468
.0073	.86333	594.9	.00001		.86332	594.9	.13968
.0074	.86924	586.9	.00001		.86922	586.9	.13478
0.0075	7.87597	579.1	0.00001	0.0	7.87595	579.0	2.14096
.0076	.88182	571.4	.00001		.88181	571.4	.13019
.0077	.88760	564.0	.00001		.88758	564.0	.12552
.0078	.89329	556.8	.00001		.89327	556.8	.12091
.0079	.89893	549.7	.00001		.89891	549.7	.11638
0.0080	7.90399	542.9	0.00001	0.0	7.90398	542.8	2.09992
.0081	.90881	535.2	.00001		.90878	535.1	.10952
.0082	.91352	527.6	.00001		.91350	527.6	.10420
.0083	.91818	520.2	.00001		.91815	520.2	.09893
.0084	.92278	513.0	.00002		.92275	513.0	.09373
0.0085	7.92942	510.9	0.00002	0.0	7.92941	510.9	2.07059
.0086	.93459	505.0	.00002		.93459	505.0	.08551
.0087	.93952	499.2	.00002		.93951	499.2	.08039
.0088	.94440	493.5	.00002		.94437	493.5	.07533
.0089	.94923	488.0	.00002		.94920	488.0	.07032
0.0090	7.95425	482.6	0.00002	0.0	7.95423	482.5	2.04577
.0091	.95905	477.3	.00002		.95903	477.2	.06567
.0092	.96379	472.1	.00002		.96378	472.0	.06052
.0093	.96849	467.0	.00002		.96847	467.0	.05533
.0094	.97313	462.0	.00002		.97312	462.0	.05018
0.0095	7.97773	457.2	0.00002	0.0	7.97771	457.1	2.02220
.0096	.98228	452.4	.00002		.98226	452.4	.04574
.0097	.98678	447.7	.00002		.98676	447.7	.04038
.0098	.99123	443.2	.00002		.99121	443.1	.03507
.0099	.99564	438.7	.00002		.99562	438.7	.02976
0.0100	8.00001	434.3	0.00002	0.0	7.99999	434.3	2.00001
u	$\log \tanh u$	$= F_1'$	$\log \coth u$	$= F_2'$	$\log \sinh u$	$= F_3'$	$\log \cosh u$

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
0.0100	8.00000	436.3	0.00000	0.00000	7.00000	434.3	7.00000
.0001	.00011	436.0	.00000	.00000	6.99989	434.0	6.99989
.0002	.00022	425.8	.00000	.00000	6.99978	433.7	6.99978
.0003	.00033	425.7	.00000	.00000	6.99967	433.6	6.99967
.0004	.00044	417.6	.00000	.00000	6.99956	433.5	6.99956
0.0105	8.02120	413.6	0.00000	0.00000	6.99945	433.4	6.99945
.0005	.00055	406.7	.00000	.00000	6.99934	433.2	6.99934
.0007	.00070	405.0	.00000	.00000	6.99923	433.0	6.99923
.0008	.00083	405.1	.00000	.00000	6.99912	432.9	6.99912
.0009	.00094	406.5	.00000	.00000	6.99901	432.8	6.99901
0.0110	8.04140	399.8	0.00000	0.00000	6.99890	432.7	6.99890
.0011	.00111	394.3	.00000	.00000	6.99879	432.5	6.99879
.0012	.00123	389.8	.00000	.00000	6.99868	432.4	6.99868
.0013	.00133	384.4	.00000	.00000	6.99857	432.3	6.99857
.0014	.00143	381.0	.00000	.00000	6.99846	432.2	6.99846
0.0115	8.06071	377.7	0.00000	0.00000	6.99835	432.1	6.99835
.0015	.00147	374.1	.00000	.00000	6.99824	432.0	6.99824
.0017	.00160	371.2	.00000	.00000	6.99813	431.9	6.99813
.0018	.00169	368.1	.00000	.00000	6.99802	431.8	6.99802
.0019	.00178	366.0	.00000	.00000	6.99791	431.7	6.99791
0.0120	8.07919	364.0	0.00000	0.00000	6.99780	431.6	6.99780
.0021	.00180	358.0	.00000	.00000	6.99769	431.5	6.99769
.0022	.00189	359.0	.00000	.00000	6.99758	431.4	6.99758
.0023	.00190	353.1	.00000	.00000	6.99747	431.3	6.99747
.0024	.00193	349.3	.00000	.00000	6.99736	431.2	6.99736
0.0125	8.09692	347.5	0.00000	0.00000	6.99725	431.1	6.99725
.0025	.00198	344.7	.00000	.00000	6.99714	431.0	6.99714
.0027	.00204	342.0	.00000	.00000	6.99703	430.9	6.99703
.0028	.00212	339.3	.00000	.00000	6.99692	430.8	6.99692
.0029	.00220	336.2	.00000	.00000	6.99681	430.7	6.99681
0.0130	8.11396	334.1	0.00000	0.00000	6.99670	430.6	6.99670
.0031	.00228	331.5	.00000	.00000	6.99659	430.5	6.99659
.0032	.00236	329.0	.00000	.00000	6.99648	430.4	6.99648
.0033	.00248	326.0	.00000	.00000	6.99637	430.3	6.99637
.0034	.00252	323.1	.00000	.00000	6.99626	430.2	6.99626
0.0135	8.13035	321.7	0.00000	0.00000	6.99615	430.1	6.99615
.0035	.00258	319.4	.00000	.00000	6.99604	430.0	6.99604
.0037	.00263	317.0	.00000	.00000	6.99593	429.9	6.99593
.0038	.00269	314.7	.00000	.00000	6.99582	429.8	6.99582
.0039	.00275	312.5	.00000	.00000	6.99571	429.7	6.99571
0.0140	8.14611	310.2	0.00000	0.00000	6.99560	429.6	6.99560
.0041	.00281	308.0	.00000	.00000	6.99549	429.5	6.99549
.0042	.00290	305.0	.00000	.00000	6.99538	429.4	6.99538
.0043	.00295	303.7	.00000	.00000	6.99527	429.3	6.99527
.0044	.00308	301.2	.00000	.00000	6.99516	429.2	6.99516
0.0145	8.16138	299.5	0.00000	0.00000	6.99505	429.1	6.99505
.0045	.00317	297.5	.00000	.00000	6.99494	429.0	6.99494
.0047	.00323	295.5	.00000	.00000	6.99483	428.9	6.99483
.0048	.00331	293.5	.00000	.00000	6.99472	428.8	6.99472
.0049	.00338	291.5	.00000	.00000	6.99461	428.7	6.99461
0.0150	8.17661	289.6	0.00000	0.00000	6.99450	428.6	6.99450
u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

u	log sinh u	= F'	log cosh u	= F'	log tanh u	= F'	log coth u
0.0150	8.17611	280,6	0.00005	0,1	8.17606	280,3	1.82304
.0151	.17890	287,6	.00005		.17894	287,6	.82106
.0152	.18186	285,7	.00005		.18181	285,7	.81819
.0153	.18471	283,0	.00005		.18466	283,8	.81534
.0154	.18754	282,0	.00005		.18749	282,0	.81251
0.0155	8.19035	280,2	0.00005	0,1	8.19030	280,1	1.80970
.0156	.19314	278,4	.00005		.19309	278,3	.80691
.0157	.19592	276,6	.00005		.19586	276,0	.80414
.0158	.19868	274,0	.00005		.19862	274,8	.80138
.0159	.20142	273,2	.00005		.20136	273,1	.79864
0.0160	8.20414	271,3	0.00005	0,1	8.20408	271,4	1.79589
.0161	.20684	269,3	.00006		.20679	269,7	.79341
.0162	.20953	268,1	.00006		.20948	268,0	.79092
.0163	.21221	266,5	.00006		.21215	266,4	.78845
.0164	.21486	264,8	.00006		.21480	264,8	.78590
0.0165	8.21750	263,2	0.00006	0,1	8.21744	263,2	1.78325
.0166	.22013	261,6	.00006		.22007	261,6	.77993
.0167	.22274	260,1	.00006		.22268	260,0	.77732
.0168	.22533	258,8	.00006		.22527	258,5	.77473
.0169	.22791	257,0	.00006		.22785	256,9	.77215
0.0170	8.23047	255,5	0.00006	0,1	8.23041	255,4	1.76950
.0171	.23302	254,0	.00006		.23295	253,9	.76705
.0172	.23555	252,5	.00006		.23549	252,4	.76451
.0173	.23807	251,1	.00006		.23800	251,0	.76200
.0174	.24057	249,6	.00007		.24051	249,5	.75940
0.0175	8.24306	248,2	0.00007	0,1	8.24299	248,1	1.75701
.0176	.24554	246,8	.00007		.24547	246,7	.75453
.0177	.24800	245,4	.00007		.24793	245,3	.75207
.0178	.25044	244,0	.00007		.25037	243,0	.74963
.0179	.25288	242,6	.00007		.25281	242,6	.74719
0.0180	8.25530	241,3	0.00007	0,1	8.25523	241,2	1.74477
.0181	.25770	240,0	.00007		.25763	239,0	.74237
.0182	.26010	238,6	.00007		.26002	238,0	.73998
.0183	.26248	237,3	.00007		.26240	237,3	.73760
.0184	.26484	236,1	.00007		.26477	236,0	.73523
0.0185	8.26720	234,8	0.00007	0,1	8.26712	234,7	1.73288
.0186	.26954	233,5	.00008		.26946	233,4	.73054
.0187	.27187	232,3	.00008		.27179	232,2	.72821
.0188	.27418	231,0	.00008		.27411	231,0	.72589
.0189	.27649	229,8	.00008		.27641	229,7	.72359
0.0190	8.27878	228,6	0.00008	0,1	8.27870	228,5	1.72130
.0191	.28106	227,4	.00008		.28098	227,3	.71892
.0192	.28333	226,2	.00008		.28325	226,1	.71657
.0193	.28559	225,1	.00008		.28550	225,0	.71426
.0194	.28783	223,0	.00008		.28775	223,8	.71192
0.0195	8.29006	222,7	0.00008	0,1	8.29008	222,7	1.71002
.0196	.29228	221,6	.00008		.29220	221,5	.70760
.0197	.29449	220,5	.00008		.29441	220,4	.70519
.0198	.29669	219,4	.00009		.29661	219,3	.70280
.0199	.29888	218,3	.00009		.29880	218,2	.70040
0.0200	8.30106	217,2	0.00009	0,1	8.30097	217,1	1.69903
u	log tan gd u	= F'	log sec gd u	= F'	log sin gd u	= F'	log cos gd u

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$\frac{u}{F'}$	$\log \cosh u$	$\frac{u}{F'}$	$\log \tanh u$	$\frac{u}{F'}$	$\log \coth u$
0.0200	8.30106	217.2	0.00009	0.1	8.30097	217.1	1.69003
.0001	.30323	216.1	.00000		.30314	216.0	.69686
.0002	.30538	215.0	.00000		.30529	214.9	.69371
.0003	.30753	214.0	.00000		.30744	213.9	.69056
.0004	.30968	212.9	.00000		.30957	212.8	.68741
0.0205	8.31198	211.0	0.00009	0.1	8.31160	211.8	1.68811
.0005	.31390	210.0	.00000		.31381	210.8	.68509
.0007	.31600	209.8	.00000		.31591	209.7	.68199
.0008	.31809	208.8	.00000		.31800	208.7	.67890
.0009	.32018	207.8	.00000		.32008	207.7	.67582
0.0210	8.32225	206.8	0.00010	0.1	8.32216	206.7	1.67784
.0011	.32431	205.9	.00010		.32422	205.8	.67578
.0012	.32637	204.9	.00010		.32627	204.8	.67373
.0013	.32841	203.9	.00010		.32831	203.8	.67169
.0014	.33045	202.9	.00010		.33035	202.9	.66965
0.0215	8.33247	202.0	0.00010	0.1	8.33237	201.9	1.66963
.0015	.33449	201.1	.00010		.33439	201.0	.66761
.0017	.33649	200.2	.00010		.33639	200.1	.66560
.0018	.33849	199.2	.00010		.33839	199.1	.66361
.0019	.34048	198.3	.00010		.34037	198.2	.66163
0.0220	8.34246	197.4	0.00011	0.1	8.34235	197.3	1.66165
.0021	.34443	196.5	.00011		.34432	196.4	.65968
.0022	.34639	195.7	.00011		.34628	195.6	.65772
.0023	.34834	194.8	.00011		.34823	194.7	.65577
.0024	.35028	193.9	.00011		.35018	193.8	.65382
0.0225	8.35222	193.1	0.00012	0.1	8.35211	193.0	1.65389
.0025	.35415	192.2	.00012		.35403	192.1	.65197
.0027	.35606	191.4	.00012		.35593	191.3	.64995
.0028	.35797	190.5	.00012		.35780	190.4	.64794
.0029	.35987	189.7	.00012		.35970	189.6	.64594
0.0230	8.36177	188.9	0.00012	0.1	8.36168	188.8	1.64595
.0031	.36365	188.0	.00012		.36353	187.9	.64397
.0032	.36553	187.2	.00012		.36541	187.1	.64199
.0033	.36740	186.4	.00012		.36728	186.3	.63997
.0034	.36926	185.6	.00012		.36914	185.5	.63796
0.0235	8.37111	184.8	0.00012	0.1	8.37099	184.7	1.63791
.0035	.37295	184.1	.00012		.37283	184.0	.63597
.0037	.37479	183.3	.00012		.37467	183.2	.63393
.0038	.37662	182.5	.00012		.37649	182.4	.63191
.0039	.37844	181.7	.00012		.37832	181.6	.62988
0.0240	8.38025	181.0	0.00013	0.1	8.38013	180.9	1.62987
.0041	.38206	180.2	.00013		.38193	180.1	.62797
.0042	.38386	179.5	.00013		.38373	179.4	.62602
.0043	.38565	178.8	.00013		.38552	178.7	.62408
.0044	.38743	178.0	.00013		.38730	177.9	.62209
0.0245	8.38921	177.3	0.00013	0.1	8.38908	177.2	1.62202
.0045	.38998	176.6	.00013		.38985	176.5	.62005
.0047	.39174	175.9	.00013		.39161	175.8	.61809
.0048	.39350	175.2	.00013		.39336	175.1	.61614
.0049	.39524	174.5	.00013		.39509	174.4	.61418
0.0250	8.39709	173.8	0.00014	0.1	8.39695	173.7	1.61415
u	$\log \sinh u$	$\frac{u}{F'}$	$\log \cosh u$	$\frac{u}{F'}$	$\log \tanh u$	$\frac{u}{F'}$	$\log \coth u$

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
0.0050	8.00999	12.148	0.000014	0.1	8.00999	12.149	1.00015
0.0051	8.01002	12.149	0.000014		8.01002	12.149	1.00012
0.0052	8.01005	12.150	0.000014		8.01005	12.150	1.00009
0.0053	8.01008	12.151	0.000014		8.01008	12.151	1.00006
0.0054	8.01011	12.152	0.000014		8.01011	12.152	1.00003
0.0055	8.01014	12.153	0.000014		8.01014	12.153	1.00000
0.0056	8.01017	12.154	0.000014	0.1	8.01017	12.154	1.00005
0.0057	8.01020	12.155	0.000014		8.01020	12.155	1.00002
0.0058	8.01023	12.156	0.000014		8.01023	12.156	1.00000
0.0059	8.01026	12.157	0.000014		8.01026	12.157	1.00005
0.0060	8.01029	12.158	0.000014	0.1	8.01029	12.158	1.00002
0.0061	8.01032	12.159	0.000014		8.01032	12.159	1.00000
0.0062	8.01035	12.160	0.000014		8.01035	12.160	1.00005
0.0063	8.01038	12.161	0.000014		8.01038	12.161	1.00002
0.0064	8.01041	12.162	0.000014		8.01041	12.162	1.00000
0.0065	8.01044	12.163	0.000014	0.1	8.01044	12.163	1.00005
0.0066	8.01047	12.164	0.000014		8.01047	12.164	1.00002
0.0067	8.01050	12.165	0.000014		8.01050	12.165	1.00000
0.0068	8.01053	12.166	0.000014		8.01053	12.166	1.00005
0.0069	8.01056	12.167	0.000014	0.1	8.01056	12.167	1.00002
0.0070	8.01059	12.168	0.000014		8.01059	12.168	1.00000
0.0071	8.01062	12.169	0.000014		8.01062	12.169	1.00005
0.0072	8.01065	12.170	0.000014		8.01065	12.170	1.00002
0.0073	8.01068	12.171	0.000014		8.01068	12.171	1.00000
0.0074	8.01071	12.172	0.000014	0.1	8.01071	12.172	1.00005
0.0075	8.01074	12.173	0.000014		8.01074	12.173	1.00002
0.0076	8.01077	12.174	0.000014		8.01077	12.174	1.00000
0.0077	8.01080	12.175	0.000014		8.01080	12.175	1.00005
0.0078	8.01083	12.176	0.000014		8.01083	12.176	1.00002
0.0079	8.01086	12.177	0.000014		8.01086	12.177	1.00000
0.0080	8.01089	12.178	0.000014	0.1	8.01089	12.178	1.00005
0.0081	8.01092	12.179	0.000014		8.01092	12.179	1.00002
0.0082	8.01095	12.180	0.000014		8.01095	12.180	1.00000
0.0083	8.01098	12.181	0.000014		8.01098	12.181	1.00005
0.0084	8.01101	12.182	0.000014		8.01101	12.182	1.00002
0.0085	8.01104	12.183	0.000014	0.1	8.01104	12.183	1.00000
0.0086	8.01107	12.184	0.000014		8.01107	12.184	1.00005
0.0087	8.01110	12.185	0.000014		8.01110	12.185	1.00002
0.0088	8.01113	12.186	0.000014		8.01113	12.186	1.00000
0.0089	8.01116	12.187	0.000014		8.01116	12.187	1.00005
0.0090	8.01119	12.188	0.000014	0.1	8.01119	12.188	1.00002
0.0091	8.01122	12.189	0.000014		8.01122	12.189	1.00000
0.0092	8.01125	12.190	0.000014		8.01125	12.190	1.00005
0.0093	8.01128	12.191	0.000014		8.01128	12.191	1.00002
0.0094	8.01131	12.192	0.000014		8.01131	12.192	1.00000
0.0095	8.01134	12.193	0.000014	0.1	8.01134	12.193	1.00005
0.0096	8.01137	12.194	0.000014		8.01137	12.194	1.00002
0.0097	8.01140	12.195	0.000014		8.01140	12.195	1.00000
0.0098	8.01143	12.196	0.000014		8.01143	12.196	1.00005
0.0099	8.01146	12.197	0.000014	0.1	8.01146	12.197	1.00002
0.0100	8.01149	12.198	0.000014		8.01149	12.198	1.00000
0.0101	8.01152	12.199	0.000014		8.01152	12.199	1.00005
0.0102	8.01155	12.200	0.000014		8.01155	12.200	1.00002
0.0103	8.01158	12.201	0.000014		8.01158	12.201	1.00000
0.0104	8.01161	12.202	0.000014	0.1	8.01161	12.202	1.00005
0.0105	8.01164	12.203	0.000014		8.01164	12.203	1.00002
0.0106	8.01167	12.204	0.000014		8.01167	12.204	1.00000
0.0107	8.01170	12.205	0.000014		8.01170	12.205	1.00005
0.0108	8.01173	12.206	0.000014		8.01173	12.206	1.00002
0.0109	8.01176	12.207	0.000014		8.01176	12.207	1.00000
0.0110	8.01179	12.208	0.000014	0.1	8.01179	12.208	1.00005
0.0111	8.01182	12.209	0.000014		8.01182	12.209	1.00002
0.0112	8.01185	12.210	0.000014		8.01185	12.210	1.00000
0.0113	8.01188	12.211	0.000014		8.01188	12.211	1.00005
0.0114	8.01191	12.212	0.000014		8.01191	12.212	1.00002
0.0115	8.01194	12.213	0.000014		8.01194	12.213	1.00000
0.0116	8.01197	12.214	0.000014	0.1	8.01197	12.214	1.00005
0.0117	8.01200	12.215	0.000014		8.01200	12.215	1.00002
0.0118	8.01203	12.216	0.000014		8.01203	12.216	1.00000
0.0119	8.01206	12.217	0.000014		8.01206	12.217	1.00005
0.0120	8.01209	12.218	0.000014	0.1	8.01209	12.218	1.00002
0.0121	8.01212	12.219	0.000014		8.01212	12.219	1.00000
0.0122	8.01215	12.220	0.000014		8.01215	12.220	1.00005
0.0123	8.01218	12.221	0.000014		8.01218	12.221	1.00002
0.0124	8.01221	12.222	0.000014		8.01221	12.222	1.00000
0.0125	8.01224	12.223	0.000014	0.1	8.01224	12.223	1.00005
0.0126	8.01227	12.224	0.000014		8.01227	12.224	1.00002
0.0127	8.01230	12.225	0.000014		8.01230	12.225	1.00000
0.0128	8.01233	12.226	0.000014		8.01233	12.226	1.00005
0.0129	8.01236	12.227	0.000014		8.01236	12.227	1.00002
0.0130	8.01239	12.228	0.000014	0.1	8.01239	12.228	1.00000
0.0131	8.01242	12.229	0.000014		8.01242	12.229	1.00005
0.0132	8.01245	12.230	0.000014		8.01245	12.230	1.00002
0.0133	8.01248	12.231	0.000014		8.01248	12.231	1.00000
0.0134	8.01251	12.232	0.000014		8.01251	12.232	1.00005
0.0135	8.01254	12.233	0.000014	0.1	8.01254	12.233	1.00002
0.0136	8.01257	12.234	0.000014		8.01257	12.234	1.00000
0.0137	8.01260	12.235	0.000014		8.01260	12.235	1.00005
0.0138	8.01263	12.236	0.000014		8.01263	12.236	1.00002
0.0139	8.01266	12.237	0.000014		8.01266	12.237	1.00000
0.0140	8.01269	12.238	0.000014	0.1	8.01269	12.238	1.00005
0.0141	8.01272	12.239	0.000014		8.01272	12.239	1.00002
0.0142	8.01275	12.240	0.000014		8.01275	12.240	1.00000
0.0143	8.01278	12.241	0.000014		8.01278	12.241	1.00005
0.0144	8.01281	12.242	0.000014		8.01281	12.242	1.00002
0.0145	8.01284	12.243	0.000014		8.01284	12.243	1.00000
0.0146	8.01287	12.244	0.000014	0.1	8.01287	12.244	1.00005
0.0147	8.01290	12.245	0.000014		8.01290	12.245	1.00002
0.0148	8.01293	12.246	0.000014		8.01293	12.246	1.00000
0.0149	8.01296	12.247	0.000014		8.01296	12.247	1.00005
0.0150	8.01299	12.248	0.000014	0.1	8.01299	12.248	1.00002
0.0151	8.01302	12.249	0.000014		8.01302	12.249	1.00000
0.0152	8.01305	12.250	0.000014		8.01305	12.250	1.00005
0.0153	8.01308	12.251	0.000014		8.01308	12.251	1.00002
0.0154	8.01311	12.252	0.000014		8.01311	12.252	1.00000
0.0155	8.01314	12.253	0.000014	0.1	8.01314	12.253	1.00005
0.0156	8.01317	12.254	0.000014		8.01317	12.254	1.00002
0.0157	8.01320	12.255	0.000014		8.01320	12.255	1.00000
0.0158	8.01323	12.256	0.000014		8.01323	12.256	1.00005
0.0159	8.01326	12.257	0.000014		8.01326	12.257	1.00002
0.0160	8.01329	12.258	0.000014	0.1	8.01329	12.258	1.00000
0.0161	8.01332	12.259	0.000014		8.01332	12.259	1.00005
0.0162	8.01335	12.260	0.000014		8.01335	12.260	1.00002
0.0163	8.01338	12.261	0.000014		8.01338	12.261	1.00000
0.0164	8.01341	12.262	0.000014		8.01341	12.262	1.00005
0.0165	8.01344	12.263	0.000014	0.1	8.01344	12.263	1.00002
0.0166	8.01347	12.264	0.000014		8.01347	12.264	1.00000
0.0167	8.01350	12.265	0.000014		8.01350	12.265	1.00005
0.0168	8.01353	12.266	0.000014		8.01353	12.266	1.00002
0.0169	8.01356	12.267	0.000014		8.01356	12.267	1.00000
0.0170	8.01359	12.268	0.000014	0.1	8.01359	12.268	1.00005
0.0171	8.01362	12.269	0.000014		8.01362	12.269	1.00002
0.0172	8.01365	12.270	0.000014		8.01365	12.270	1.00000
0.0173	8.01368	12.271	0.000014		8.01368	12.271	1.00005
0.0174	8.01371	12.272	0.000014		8.01371	12.272	1.00002
0.0175	8.01374	12.273	0.000014	0.1	8.01374	12.273	1.00000
0.0176	8.01377	12.274	0.000014		8.01377	12.274	1.00005
0.0177	8.01380	12.275	0.000014		8.01380	12.275	1.00002
0.0178	8.01383	12.276	0.000014		8.01383	12.276	1.00000
0.0179	8.01386	12.277	0.000014		8.01386	12.277	1.00005
0.0180	8.01389	12.278	0.000014	0.1	8.01389	12.278	1.00002
0.0181	8.01392	12.279	0.000014		8.01392	12.279	1.00000
0.0182	8.01395	12.280	0.000014		8.01395	12.280	1.0

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F'$	$\log \cosh u$	$= F'$	$\log \tanh u$	$= F'$	$\log \coth u$
0.0300	8.47719	144.8	0.00020	0.1	8.47199	144.7	1.51201
0.0301	.47881	144.3	.00030		.47811	144.1	.51150
0.0302	.48009	143.8	.00040		.47687	143.7	.51103
0.0303	.48151	143.1	.00050		.47543	143.2	.51059
0.0304	.48324	142.0	.00060		.47374	142.8	.51026
0.0305	8.48437	141.4	0.00070	0.1	8.46917	141.3	1.51083
0.0306	.48579	141.0	.00080		.46759	141.2	.51041
0.0307	.48721	140.5	.00090		.46595	141.1	.51000
0.0308	.48862	140.0	.00100		.46411	140.9	.50959
0.0309	.49003	139.0	.00120		.46253	140.5	.50918
0.0310	8.49143	138.1	0.00130	0.1	8.46122	139.0	1.50878
0.0311	.49283	138.7	.00140		.45962	138.9	.50838
0.0312	.49423	138.2	.00150		.45801	138.8	.50799
0.0313	.49562	137.8	.00160		.45640	138.7	.50760
0.0314	.49700	137.4	.00170		.45479	138.5	.50721
0.0315	8.49838	137.0	0.00180	0.1	8.46417	137.8	1.50683
0.0316	.49978	137.5	.00190		.45254	137.7	.50645
0.0317	.50113	137.0	.00200		.45093	137.6	.50606
0.0318	.50250	136.6	.00210		.44932	137.5	.50567
0.0319	.50386	136.2	.00220		.44771	137.4	.50528
0.0320	8.50522	135.8	0.00230	0.1	8.46000	135.7	1.50490
0.0321	.50658	135.3	.00240		.44610	135.7	.50451
0.0322	.50793	134.9	.00250		.44449	135.6	.50412
0.0323	.50928	134.5	.00260		.44288	135.5	.50373
0.0324	.51062	134.1	.00270		.44127	135.4	.50334
0.0325	8.51196	133.7	0.00280	0.1	8.51173	133.5	1.50297
0.0326	.51330	133.3	.00290		.43966	133.4	.50258
0.0327	.51463	132.9	.00300		.43805	133.3	.50219
0.0328	.51595	132.5	.00310		.43644	133.2	.50180
0.0329	.51727	132.1	.00320		.43483	133.0	.50141
0.0330	8.51859	131.7	0.00330	0.1	8.51816	131.5	1.50104
0.0331	.51993	131.3	.00340		.43322	131.4	.50065
0.0332	.52122	130.9	.00350		.43161	131.3	.50026
0.0333	.52252	130.5	.00360		.43000	131.2	.49987
0.0334	.52383	130.1	.00370		.42839	131.0	.49948
0.0335	8.52513	129.7	0.00380	0.1	8.52518	129.5	1.49911
0.0336	.52642	129.3	.00390		.42678	129.4	.49872
0.0337	.52771	128.9	.00400		.42517	129.3	.49833
0.0338	.52900	128.5	.00410		.42356	129.2	.49794
0.0339	.53028	128.2	.00420		.42195	129.0	.49755
0.0340	8.53195	127.8	0.00430	0.1	8.53131	127.6	1.49718
0.0341	.53284	127.4	.00440		.42034	127.5	.49679
0.0342	.53411	127.0	.00450		.41873	127.4	.49640
0.0343	.53538	126.7	.00460		.41712	127.3	.49601
0.0344	.53664	126.3	.00470		.41551	127.1	.49562
0.0345	8.53791	125.9	0.00480	0.1	8.53765	125.8	1.49525
0.0346	.53906	125.5	.00490		.41390	125.7	.49486
0.0347	.54032	125.2	.00500		.41229	125.6	.49447
0.0348	.54157	124.8	.00510		.41068	125.4	.49408
0.0349	.54283	124.5	.00520		.40907	125.3	.49369
0.0350	8.54416	124.1	0.00530	0.1	8.54380	124.0	1.49331

BRIDGEMAN TABLES

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
0.0150	8.54416	124.1	0.00027	0.3	8.54416	124.0	1.45611
.0151	.54540	123.8	.00027		.54543	123.0	.45687
.0152	.54663	123.4	.00027		.54666	123.3	.45764
.0153	.54786	123.1	.00027		.54789	122.0	.45841
.0154	.54909	122.7	.00027		.54912	122.0	.45918
0.0315	8.55032	122.4	0.00027	0.2	8.55035	122.3	1.46005
.0316	.55154	122.0	.00028		.55157	121.0	.46073
.0317	.55276	121.7	.00028		.55279	121.5	.46152
.0318	.55398	121.4	.00028		.55401	121.2	.46230
.0319	.55519	121.0	.00028		.55522	120.9	.46309
0.0480	8.55640	120.7	0.00028	0.2	8.55641	120.5	1.46389
.0481	.55760	120.4	.00028		.55763	120.4	.46468
.0482	.55880	120.0	.00028		.55883	119.9	.46548
.0483	.56000	119.7	.00029		.56002	119.5	.46628
.0484	.56120	119.4	.00029		.56122	119.2	.46709
0.0645	8.56230	119.0	0.00029	0.2	8.56231	118.9	1.46790
.0646	.56349	118.7	.00029		.56352	118.0	.46871
.0647	.56469	118.4	.00029		.56472	118.2	.46953
.0648	.56588	118.1	.00029		.56591	117.9	.47035
.0649	.56707	117.7	.00030		.56710	117.0	.47117
0.0810	8.56830	117.4	0.00030	0.2	8.56830	117.3	1.47200
.0811	.56949	117.1	.00030		.56952	117.0	.47282
.0812	.57068	116.8	.00030		.57071	116.0	.47366
.0813	.57187	116.5	.00030		.57190	116.3	.47450
.0814	.57307	116.2	.00030		.57310	116.0	.47533
0.0975	8.57413	115.0	0.00031	0.2	8.57413	115.7	1.47617
.0976	.57532	114.6	.00031		.57535	115.4	.47699
.0977	.57651	114.3	.00031		.57654	115.1	.47782
.0978	.57770	114.0	.00031		.57773	114.8	.47866
.0979	.57889	113.6	.00031		.57892	114.5	.47950
0.0980	8.57989	113.3	0.00031	0.2	8.57989	114.2	1.48033
.0981	.58108	113.0	.00032		.58111	113.9	.48117
.0982	.58227	112.7	.00032		.58230	113.0	.48201
.0983	.58346	112.4	.00032		.58349	112.3	.48285
.0984	.58464	112.1	.00032		.58467	112.0	.48369
0.0985	8.58563	111.8	0.00032	0.2	8.58563	111.7	1.48453
.0986	.58682	111.5	.00032		.58685	111.4	.48537
.0987	.58801	111.2	.00033		.58804	111.1	.48621
.0988	.58920	110.9	.00033		.58923	111.8	.48705
.0989	.59039	111.7	.00033		.59042	111.5	.48789
0.0990	8.59137	111.4	0.00033	0.2	8.59137	111.2	1.48873
.0991	.59256	111.1	.00033		.59259	111.0	.48957
.0992	.59375	110.8	.00033		.59378	110.7	.49041
.0993	.59494	110.5	.00034		.59497	110.4	.49125
.0994	.59613	110.3	.00034		.59616	110.1	.49209
0.0995	8.59711	110.0	0.00034	0.2	8.59711	109.8	1.49293
.0996	.59830	109.7	.00034		.59833	109.0	.49377
.0997	.59949	109.5	.00034		.59952	109.3	.49461
.0998	.60068	109.2	.00034		.60071	109.0	.49545
.0999	.60187	108.9	.00035		.60190	108.7	.49629
0.0990	8.60285	108.6	0.00035	0.2	8.60285	108.5	1.49713
u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$\sinh u$	$\log \cosh u$	$\cosh u$	$\log \tanh u$	$\tanh u$	$\log \coth u$
0.0000	8.66288	108.6	0.000005	1.2	8.66288	108.6	1.00000
0.0010	8.66285	108.5	0.000015	1.2	8.66285	108.5	1.00001
0.0020	8.66281	108.4	0.000035	1.2	8.66281	108.4	1.00003
0.0030	8.66276	108.3	0.000065	1.2	8.66276	108.3	1.00006
0.0040	8.66271	108.2	0.000105	1.2	8.66271	108.2	1.00010
0.0050	8.66265	108.1	0.000155	1.2	8.66265	108.1	1.00015
0.0060	8.66258	108.0	0.000215	1.2	8.66258	108.0	1.00021
0.0070	8.66251	107.9	0.000285	1.2	8.66251	107.9	1.00028
0.0080	8.66243	107.8	0.000365	1.2	8.66243	107.8	1.00036
0.0090	8.66235	107.7	0.000455	1.2	8.66235	107.7	1.00045
0.0100	8.66226	107.6	0.000555	1.2	8.66226	107.6	1.00055
0.0110	8.66217	107.5	0.000665	1.2	8.66217	107.5	1.00066
0.0120	8.66207	107.4	0.000785	1.2	8.66207	107.4	1.00078
0.0130	8.66197	107.3	0.000915	1.2	8.66197	107.3	1.00091
0.0140	8.66186	107.2	0.001055	1.2	8.66186	107.2	1.00105
0.0150	8.66175	107.1	0.001205	1.2	8.66175	107.1	1.00120
0.0160	8.66163	107.0	0.001365	1.2	8.66163	107.0	1.00136
0.0170	8.66151	106.9	0.001535	1.2	8.66151	106.9	1.00153
0.0180	8.66138	106.8	0.001715	1.2	8.66138	106.8	1.00171
0.0190	8.66125	106.7	0.001905	1.2	8.66125	106.7	1.00190
0.0200	8.66111	106.6	0.002105	1.2	8.66111	106.6	1.00210
0.0210	8.66097	106.5	0.002315	1.2	8.66097	106.5	1.00231
0.0220	8.66082	106.4	0.002535	1.2	8.66082	106.4	1.00253
0.0230	8.66067	106.3	0.002765	1.2	8.66067	106.3	1.00276
0.0240	8.66051	106.2	0.003005	1.2	8.66051	106.2	1.00300
0.0250	8.66035	106.1	0.003255	1.2	8.66035	106.1	1.00325
0.0260	8.66018	106.0	0.003515	1.2	8.66018	106.0	1.00351
0.0270	8.65999	105.9	0.003785	1.2	8.65999	105.9	1.00378
0.0280	8.65980	105.8	0.004065	1.2	8.65980	105.8	1.00406
0.0290	8.65959	105.7	0.004355	1.2	8.65959	105.7	1.00435
0.0300	8.65938	105.6	0.004655	1.2	8.65938	105.6	1.00465
0.0310	8.65915	105.5	0.004965	1.2	8.65915	105.5	1.00496
0.0320	8.65892	105.4	0.005285	1.2	8.65892	105.4	1.00528
0.0330	8.65867	105.3	0.005615	1.2	8.65867	105.3	1.00561
0.0340	8.65842	105.2	0.005955	1.2	8.65842	105.2	1.00595
0.0350	8.65815	105.1	0.006305	1.2	8.65815	105.1	1.00630
0.0360	8.65788	105.0	0.006665	1.2	8.65788	105.0	1.00666
0.0370	8.65759	104.9	0.007035	1.2	8.65759	104.9	1.00703
0.0380	8.65729	104.8	0.007415	1.2	8.65729	104.8	1.00741
0.0390	8.65698	104.7	0.007805	1.2	8.65698	104.7	1.00780
0.0400	8.65666	104.6	0.008205	1.2	8.65666	104.6	1.00820
0.0410	8.65633	104.5	0.008615	1.2	8.65633	104.5	1.00861
0.0420	8.65599	104.4	0.009035	1.2	8.65599	104.4	1.00903
0.0430	8.65564	104.3	0.009465	1.2	8.65564	104.3	1.00946
0.0440	8.65528	104.2	0.009905	1.2	8.65528	104.2	1.00990
0.0450	8.65491	104.1	0.010355	1.2	8.65491	104.1	1.01035
0.0460	8.65453	104.0	0.010815	1.2	8.65453	104.0	1.01081
0.0470	8.65414	103.9	0.011285	1.2	8.65414	103.9	1.01128
0.0480	8.65374	103.8	0.011765	1.2	8.65374	103.8	1.01176
0.0490	8.65333	103.7	0.012255	1.2	8.65333	103.7	1.01225
0.0500	8.65291	103.6	0.012755	1.2	8.65291	103.6	1.01275
0.0510	8.65248	103.5	0.013265	1.2	8.65248	103.5	1.01326
0.0520	8.65204	103.4	0.013785	1.2	8.65204	103.4	1.01378
0.0530	8.65159	103.3	0.014315	1.2	8.65159	103.3	1.01431
0.0540	8.65113	103.2	0.014855	1.2	8.65113	103.2	1.01485
0.0550	8.65066	103.1	0.015405	1.2	8.65066	103.1	1.01540
0.0560	8.65018	103.0	0.015965	1.2	8.65018	103.0	1.01596
0.0570	8.64969	102.9	0.016535	1.2	8.64969	102.9	1.01653
0.0580	8.64919	102.8	0.017115	1.2	8.64919	102.8	1.01711
0.0590	8.64868	102.7	0.017705	1.2	8.64868	102.7	1.01770
0.0600	8.64816	102.6	0.018305	1.2	8.64816	102.6	1.01830
0.0610	8.64763	102.5	0.018915	1.2	8.64763	102.5	1.01891
0.0620	8.64709	102.4	0.019535	1.2	8.64709	102.4	1.01953
0.0630	8.64654	102.3	0.020165	1.2	8.64654	102.3	1.02016
0.0640	8.64598	102.2	0.020805	1.2	8.64598	102.2	1.02080
0.0650	8.64541	102.1	0.021455	1.2	8.64541	102.1	1.02145
0.0660	8.64483	102.0	0.022115	1.2	8.64483	102.0	1.02211
0.0670	8.64424	101.9	0.022785	1.2	8.64424	101.9	1.02278
0.0680	8.64364	101.8	0.023465	1.2	8.64364	101.8	1.02346
0.0690	8.64303	101.7	0.024155	1.2	8.64303	101.7	1.02415
0.0700	8.64241	101.6	0.024855	1.2	8.64241	101.6	1.02485
0.0710	8.64178	101.5	0.025565	1.2	8.64178	101.5	1.02556
0.0720	8.64114	101.4	0.026285	1.2	8.64114	101.4	1.02628
0.0730	8.64049	101.3	0.027015	1.2	8.64049	101.3	1.02701
0.0740	8.63983	101.2	0.027755	1.2	8.63983	101.2	1.02775
0.0750	8.63916	101.1	0.028505	1.2	8.63916	101.1	1.02850
0.0760	8.63848	101.0	0.029265	1.2	8.63848	101.0	1.02926
0.0770	8.63779	100.9	0.030035	1.2	8.63779	100.9	1.03003
0.0780	8.63709	100.8	0.030815	1.2	8.63709	100.8	1.03081
0.0790	8.63638	100.7	0.031605	1.2	8.63638	100.7	1.03160
0.0800	8.63566	100.6	0.032405	1.2	8.63566	100.6	1.03240
0.0810	8.63493	100.5	0.033215	1.2	8.63493	100.5	1.03321
0.0820	8.63419	100.4	0.034035	1.2	8.63419	100.4	1.03403
0.0830	8.63344	100.3	0.034865	1.2	8.63344	100.3	1.03486
0.0840	8.63268	100.2	0.035705	1.2	8.63268	100.2	1.03570
0.0850	8.63191	100.1	0.036555	1.2	8.63191	100.1	1.03655
0.0860	8.63113	100.0	0.037415	1.2	8.63113	100.0	1.03741
0.0870	8.63034	99.9	0.038285	1.2	8.63034	99.9	1.03828
0.0880	8.62954	99.8	0.039165	1.2	8.62954	99.8	1.03916
0.0890	8.62873	99.7	0.040055	1.2	8.62873	99.7	1.04005
0.0900	8.62791	99.6	0.040955	1.2	8.62791	99.6	1.04095
0.0910	8.62708	99.5	0.041865	1.2	8.62708	99.5	1.04186
0.0920	8.62624	99.4	0.042785	1.2	8.62624	99.4	1.04278
0.0930	8.62539	99.3	0.043715	1.2	8.62539	99.3	1.04371
0.0940	8.62453	99.2	0.044655	1.2	8.62453	99.2	1.04465
0.0950	8.62366	99.1	0.045605	1.2	8.62366	99.1	1.04560
0.0960	8.62278	99.0	0.046565	1.2	8.62278	99.0	1.04656
0.0970	8.62189	98.9	0.047535	1.2	8.62189	98.9	1.04753
0.0980	8.62099	98.8	0.048515	1.2	8.62099	98.8	1.04851
0.0990	8.62008	98.7	0.049505	1.2	8.62008	98.7	1.04950
0.1000	8.61916	98.6	0.050505	1.2	8.61916	98.6	1.05050

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

x	$\log \sinh x$	$= F_1'$	$\log \cosh x$	$= F_2'$	$\log \tanh x$	$= F_3'$	$\log \coth x$
0.0050	8.65326	96.6	0.00044	0.2	8.65292	96.4	1.34798
0.0151	0.65132	97.4	0.00044		0.65088	97.2	1.34702
0.0252	0.65029	98.1	0.00044		0.65084	98.0	1.34610
0.0353	0.64925	98.9	0.00045		0.65080	98.7	1.34520
0.0454	0.64821	99.7	0.00045		0.65076	99.5	1.34434
0.0555	8.64816	99.5	0.00045	0.2	8.65771	99.3	1.34329
0.0656	0.64712	99.3	0.00045		0.65766	99.1	1.34234
0.0757	0.64607	99.1	0.00045		0.65761	98.9	1.34139
0.0858	0.64503	99.9	0.00046		0.65756	98.7	1.34044
0.0959	0.64397	99.7	0.00046		0.65751	98.5	1.33949
0.1060	8.64291	99.5	0.00046	0.2	8.66215	99.3	1.33855
0.1161	0.64185	99.3	0.00046		0.66210	99.1	1.33760
0.1262	0.64080	99.1	0.00046		0.66205	98.9	1.33665
0.1363	0.63974	98.9	0.00047		0.66200	98.7	1.33570
0.1464	0.63869	98.7	0.00047		0.66195	98.5	1.33475
0.1565	8.63761	98.5	0.00047	0.2	8.66711	98.3	1.33380
0.1666	0.63654	98.3	0.00047		0.66706	98.1	1.33285
0.1767	0.63549	98.1	0.00047		0.66701	97.9	1.33190
0.1868	0.63443	97.9	0.00048		0.66696	97.7	1.33095
0.1969	0.63337	97.7	0.00048		0.66691	97.5	1.32999
0.2070	8.63229	97.5	0.00048	0.2	8.67228	97.3	1.32902
0.2171	0.63123	97.3	0.00048		0.67223	97.1	1.32807
0.2272	0.63017	97.1	0.00048		0.67218	96.9	1.32712
0.2373	0.62911	96.9	0.00049		0.67213	96.7	1.32617
0.2474	0.62805	96.7	0.00049		0.67208	96.5	1.32522
0.2575	8.62696	96.5	0.00049	0.2	8.67737	96.3	1.32427
0.2676	0.62777	96.3	0.00049		0.67732	96.1	1.32332
0.2777	0.62670	96.1	0.00049		0.67726	95.9	1.32237
0.2878	0.62563	95.9	0.00050		0.67721	95.7	1.32142
0.2979	0.62456	95.7	0.00050		0.67716	95.5	1.32047
0.3080	8.62341	95.5	0.00050	0.2	8.68241	95.3	1.31952
0.3181	0.62234	95.3	0.00050		0.68236	95.1	1.31857
0.3282	0.62127	95.1	0.00050		0.68231	94.9	1.31762
0.3383	0.62020	94.9	0.00051		0.68226	94.7	1.31667
0.3484	0.61913	94.7	0.00051		0.68221	94.5	1.31572
0.3585	8.61796	94.5	0.00051	0.2	8.68750	94.3	1.31477
0.3686	0.61689	94.3	0.00051		0.68745	94.1	1.31382
0.3787	0.61582	94.1	0.00051		0.68740	93.9	1.31287
0.3888	0.61475	93.9	0.00052		0.68735	93.7	1.31192
0.3989	0.61368	93.7	0.00052		0.68730	93.5	1.31097
0.4090	8.61251	93.5	0.00052	0.2	8.69259	93.3	1.30999
0.4191	0.61250	93.3	0.00052		0.69254	93.1	1.30904
0.4292	0.61143	93.1	0.00053		0.69249	92.9	1.30809
0.4393	0.61036	92.9	0.00053		0.69244	92.7	1.30714
0.4494	8.60919	92.7	0.00053	0.2	8.69768	92.5	1.30619
0.4595	0.60812	92.5	0.00053		0.69763	92.3	1.30524
0.4696	0.60705	92.3	0.00054		0.69758	92.1	1.30429
0.4797	0.60598	92.1	0.00054		0.69753	91.9	1.30334
0.4898	0.60491	91.9	0.00054		0.69748	91.7	1.30239
0.4999	8.60374	91.7	0.00054	0.2	8.69861	91.5	1.30144
0.5000	0.60367	91.5	0.00054				
x	$\log \sinh x$	$= F_1'$	$\log \cosh x$	$= F_2'$	$\log \tanh x$	$= F_3'$	$\log \coth x$

Logarithm of Hyperbolic Functions.

u	$\log \sinh u$	$= F'$	$\log \cosh u$	$= F'$	$\log \tanh u$	$= F'$	$\log \coth u$
0.0500	8.60045	86.0	0.00051	0.1	8.60090	39.7	1.00130
0.0501	.70007	86.0	.00051		.00117	39.5	.00055
0.0502	.70009	86.0	.00055		.20034	39.6	.00080
0.0503	.70015	86.1	.00055		.30050	39.7	.00105
0.0504	.70016	86.2	.00055		.40069	39.9	.00131
0.0505	8.70018	86.1	0.00055	0.2	8.70017	39.9	1.00200
0.0506	.70014	86.0	.00059		.50028	39.7	.00052
0.0507	.70019	86.7	.00059		.60041	39.5	.00076
0.0508	.70015	86.0	.00059		.70049	39.5	.00101
0.0509	.70014	86.4	.00059		.80054	39.7	.00126
0.0510	8.70076	86.2	0.00059	0.2	8.70070	39.9	1.00300
0.0511	.70080	86.4	.00057		.90044	39.8	.00050
0.0512	.70040	86.0	.00057		.00059	39.7	.00074
0.0513	.70011	86.7	.00057		.10061	39.5	.00098
0.0514	.70015	86.0	.00057		.20051	39.6	.00122
0.0515	8.71200	86.4	0.00058	0.2	8.71142	39.7	1.00400
0.0516	.71281	86.2	.00058		.30059	39.9	.00050
0.0517	.71268	86.1	.00058		.40060	39.9	.00074
0.0518	.71252	86.0	.00058		.50061	39.7	.00098
0.0519	.71216	86.8	.00058		.60058	39.5	.00122
0.0520	8.71620	86.0	0.00059	0.2	8.71591	39.8	1.00500
0.0521	.71703	86.4	.00059		.70051	39.5	.00050
0.0522	.71687	86.3	.00059		.80053	39.6	.00074
0.0523	.71670	86.1	.00059		.90051	39.9	.00098
0.0524	.71653	86.0	.00059		.00051	39.7	.00122
0.0525	8.72036	86.8	0.00059	0.2	8.71999	39.6	1.00600
0.0526	.72119	86.0	.00059		.10059	39.5	.00050
0.0527	.72101	86.5	.00059		.20058	39.5	.00074
0.0528	.72084	86.3	.00059		.30057	39.6	.00098
0.0529	.72066	86.2	.00059		.40055	39.9	.00122
0.0530	8.72448	86.0	0.00059	0.2	8.72387	39.8	1.00700
0.0531	.72530	86.0	.00059		.50059	39.9	.00050
0.0532	.72512	86.7	.00059		.60059	39.5	.00074
0.0533	.72493	86.0	.00059		.70057	39.6	.00098
0.0534	.72475	86.1	.00059		.80055	39.7	.00122
0.0535	8.72896	86.1	0.00059	0.2	8.72831	39.9	1.00800
0.0536	.72977	86.1	.00059		.90055	39.9	.00050
0.0537	.72958	86.0	.00059		.00055	39.7	.00074
0.0538	.72939	86.8	.00059		.10053	39.9	.00098
0.0539	.72920	86.7	.00059		.20052	39.6	.00122
0.0540	8.73360	86.5	0.00059	0.2	8.73299	39.8	1.00900
0.0541	.73441	86.4	.00059		.30052	39.5	.00050
0.0542	.73421	86.2	.00059		.40052	39.6	.00074
0.0543	.73401	86.0	.00059		.50051	39.9	.00098
0.0544	.73381	79.0	.00059		.60050	39.7	.00122
0.0545	8.73801	79.8	0.00059	0.2	8.73739	39.5	1.01000
0.0546	.73881	79.0	.00059		.70050	39.1	.00050
0.0547	.73860	79.5	.00059		.80050	39.2	.00074
0.0548	.73840	79.3	.00059		.90050	39.4	.00098
0.0549	.73820	79.2	.00059		.00050	39.6	.00122
0.0550	8.74208	79.0	0.00059	0.2	8.74146	39.8	1.01100

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$\equiv F_1'$	$\log \cosh u$	$\equiv F_2'$	$\log \tanh u$	$\equiv F_3'$	$\log \coth u$
0.0550	8.74058	74.0	0.00056	0.2	8.74001	73.8	1.25007
0.0551	741.7	74.0	0.00056		740.1	73.7	25000
0.0552	741.6	73.8	0.00056		741.0	73.5	25000
0.0553	741.5	73.6	0.00056		741.8	73.4	25772
0.0554	741.3	73.5	0.00057		741.9	73.2	25000
0.0555	8.74152	73.1	0.00057	0.1	8.74105	73.1	1.25015
0.0556	743.9	73.2	0.00057		743.9	72.9	25537
0.0557	743.8	73.0	0.00057		743.1	72.8	25159
0.0558	743.8	72.9	0.00058		743.0	72.7	25372
0.0559	743.6	72.8	0.00058		743.0	72.5	25301
0.0560	8.74241	72.6	0.00058	0.1	8.74073	72.1	1.25227
0.0561	743.9	72.5	0.00058		743.1	72.3	25149
0.0562	743.9	72.4	0.00059		743.3	72.1	25002
0.0563	743.7	72.3	0.00059		743.0	72.0	24905
0.0564	743.5	72.1	0.00059		743.2	71.8	24908
0.0565	8.74328	71.9	0.00059	0.2	8.74159	71.7	1.25381
0.0566	745.9	71.8	0.00060		745.5	71.6	25196
0.0567	745.8	71.7	0.00060		745.1	71.4	25088
0.0568	745.8	71.5	0.00060		745.0	71.3	25012
0.0569	745.5	71.4	0.00060		745.0	71.2	24536
0.0570	8.74411	71.3	0.00061	0.1	8.74349	71.0	1.25460
0.0571	745.9	71.1	0.00061		745.0	71.0	24301
0.0572	745.7	71.0	0.00061		745.0	70.8	24198
0.0573	745.6	70.9	0.00061		745.0	70.7	24142
0.0574	745.4	70.7	0.00062		745.1	70.5	24156
0.0575	8.74501	70.6	0.00062	0.2	8.74419	70.1	1.25685
0.0576	746.6	70.5	0.00062	0.1	746.1	70.2	24006
0.0577	746.4	70.4	0.00062	0.3	746.0	70.1	23911
0.0578	746.2	70.3	0.00063		746.1	70.0	23866
0.0579	746.0	70.1	0.00063		746.0	70.0	23791
0.0580	8.74587	70.0	0.00063	0.3	8.74501	70.0	1.25706
0.0581	746.1	70.0	0.00063		746.0	70.0	23691
0.0582	746.0	70.0	0.00064		746.1	70.0	23557
0.0583	746.0	70.0	0.00064		746.0	70.0	23412
0.0584	746.0	70.0	0.00064		746.0	70.0	23308
0.0585	8.74670	70.0	0.00064	0.3	8.74666	70.0	1.25831
0.0586	746.1	70.0	0.00065		746.0	70.0	23200
0.0587	746.0	70.0	0.00065		746.1	70.0	23106
0.0588	746.0	70.0	0.00065		746.0	70.0	23112
0.0589	746.0	70.0	0.00065		746.0	70.0	23039
0.0590	8.74710	70.0	0.00066	0.3	8.74635	70.0	1.25965
0.0591	746.1	70.0	0.00066		746.0	70.0	22892
0.0592	746.0	70.0	0.00066		746.1	70.0	22810
0.0593	746.0	70.0	0.00066		746.0	70.0	22745
0.0594	746.0	70.0	0.00067		746.0	70.0	22672
0.0595	8.74777	70.0	0.00067	0.3	8.74700	70.0	1.25960
0.0596	746.0	70.0	0.00067		746.0	70.0	22547
0.0597	746.0	70.0	0.00067		746.0	70.0	22515
0.0598	746.0	70.0	0.00068		746.0	70.0	22412
0.0599	746.0	70.0	0.00068		746.0	70.0	22310
0.0600	8.74841	70.0	0.00068	0.3	8.74773	70.0	1.25937
u	$\log \sinh u$	$\equiv F_1'$	$\log \cosh u$	$\equiv F_2'$	$\log \tanh u$	$\equiv F_3'$	$\log \coth u$

Logarithms of Hyperbolic Functions.

u	log sinh u	= F'	log cosh u	= F'	log tanh u	= F'	log coth u
0.0600	8.77841	72.5	0.00078	0.3	8.77763	74.2	1.22237
0.0601	.77844	72.5	.00078		.77845	74.1	.22246
0.0602	.77846	72.2	.00079		.77847	74.0	.22255
0.0603	.77848	72.1	.00079		.77849	73.8	.22264
0.0604	.77850	72.0	.00079		.77851	73.7	.22273
0.0605	8.77852	71.9	0.00079	0.3	8.77853	71.6	1.21877
0.0606	.77854	71.8	.00080		.77854	71.5	.21886
0.0607	.77856	71.6	.00080		.77856	71.4	.21894
0.0608	.77857	71.5	.00080		.77857	71.3	.21903
0.0609	.77859	71.4	.00080		.77858	71.1	.21912
0.0610	8.77859	71.3	0.00081	0.3	8.77859	71.0	1.21521
0.0611	.77861	71.2	.00081		.77860	70.9	.21530
0.0612	.77862	71.1	.00081		.77861	70.8	.21539
0.0613	.77863	70.9	.00081		.77862	70.7	.21548
0.0614	.77864	70.8	.00082		.77862	70.6	.21557
0.0615	8.77865	70.7	0.00082	0.3	8.77865	70.4	1.21167
0.0616	.77866	70.6	.00082		.77865	70.3	.21176
0.0617	.77866	70.5	.00083		.77865	70.2	.21185
0.0618	.77867	70.4	.00083		.77865	70.1	.21194
0.0619	.77867	70.3	.00083		.77865	70.0	.21203
0.0620	8.77867	70.1	0.00083	0.3	8.77867	69.9	1.20816
0.0621	.77868	70.0	.00083		.77867	69.8	.20825
0.0622	.77868	69.9	.00083		.77867	69.7	.20834
0.0623	.77868	69.8	.00083		.77867	69.6	.20843
0.0624	.77868	69.7	.00083		.77867	69.5	.20852
0.0625	8.77868	69.6	0.00083	0.3	8.77868	69.4	1.20468
0.0626	.77868	69.5	.00083		.77868	69.3	.20477
0.0627	.77868	69.4	.00083		.77868	69.2	.20486
0.0628	.77868	69.3	.00083		.77868	69.1	.20495
0.0629	.77868	69.1	.00083		.77868	68.9	.20504
0.0630	8.77868	69.0	0.00083	0.3	8.77868	68.8	1.20113
0.0631	.77868	68.9	.00083		.77868	68.7	.20122
0.0632	.77868	68.8	.00083		.77868	68.6	.20131
0.0633	.77868	68.7	.00083		.77868	68.5	.20140
0.0634	.77868	68.6	.00083		.77868	68.4	.20149
0.0635	8.77868	68.5	0.00083	0.3	8.77868	68.2	1.19761
0.0636	.77868	68.4	.00083		.77868	68.1	.19770
0.0637	.77868	68.3	.00083		.77868	68.0	.19779
0.0638	.77868	68.2	.00083		.77868	67.9	.19788
0.0639	.77868	68.1	.00083		.77868	67.8	.19797
0.0640	8.77868	68.0	0.00083	0.3	8.77868	67.7	1.19411
0.0641	.77868	67.9	.00083		.77868	67.6	.19420
0.0642	.77868	67.8	.00083		.77868	67.5	.19429
0.0643	.77868	67.7	.00083		.77868	67.4	.19438
0.0644	.77868	67.6	.00083		.77868	67.3	.19447
0.0645	8.77868	67.5	0.00083	0.3	8.77868	67.1	1.19061
0.0646	.77868	67.4	.00083		.77868	67.0	.19070
0.0647	.77868	67.3	.00083		.77868	66.9	.19079
0.0648	.77868	67.2	.00083		.77868	66.8	.19088
0.0649	.77868	67.1	.00083		.77868	66.7	.19097
0.0650	8.77868	67.0	0.00083	0.3	8.77868	66.6	1.18711
0.0651	.77868	66.9	.00083		.77868	66.5	.18720

CONTINUATION TABLE

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \operatorname{sech} u$
0.0050	8.81322	66.9	0.00092	0.3	8.81230	66.6	1.18770
.0051	8.81389	66.8	.00093		8.81297	66.5	.18793
.0052	8.81456	66.7	.00092		8.81363	66.4	.18817
.0053	8.81522	66.6	.00093		8.81430	66.3	.18840
.0054	8.81589	66.5	.00093		8.81496	66.2	.18864
0.0055	8.81655	66.4	0.00093	0.3	8.81562	66.1	1.18888
.0056	8.81722	66.3	.00093		8.81628	66.0	.18912
.0057	8.81788	66.2	.00091		8.81694	65.9	.18936
.0058	8.81854	66.1	.00091		8.81760	65.8	.18960
.0059	8.81920	66.0	.00091		8.81826	65.7	.18984
0.0060	8.81986	65.9	0.00095	0.3	8.81891	65.6	1.18999
.0061	8.82052	65.8	.00095		8.81957	65.5	.19013
.0062	8.82118	65.7	.00095		8.82022	65.4	.19038
.0063	8.82183	65.6	.00095		8.82088	65.3	.19062
.0064	8.82249	65.5	.00095		8.82153	65.2	.19087
0.0065	8.82314	65.4	0.00095	0.3	8.82218	65.1	1.19102
.0066	8.82380	65.3	.00095		8.82283	65.0	.19127
.0067	8.82445	65.2	.00097		8.82348	64.9	.19152
.0068	8.82510	65.1	.00097		8.82413	64.8	.19177
.0069	8.82575	65.0	.00097		8.82478	64.7	.19202
0.0070	8.82640	64.9	0.00097	0.3	8.82543	64.6	1.19217
.0071	8.82705	64.8	.00098		8.82607	64.5	.19242
.0072	8.82770	64.7	.00098		8.82672	64.4	.19267
.0073	8.82834	64.6	.00098		8.82736	64.3	.19292
.0074	8.82899	64.5	.00099		8.82800	64.2	.19317
0.0075	8.82963	64.4	0.00099	0.3	8.82864	64.1	1.19332
.0076	8.83028	64.3	.00099		8.82929	64.0	.19357
.0077	8.83092	64.2	.00099		8.82993	63.9	.19382
.0078	8.83156	64.1	.00100		8.83058	63.8	.19407
.0079	8.83220	64.0	.00100		8.83122	63.7	.19432
0.0080	8.83284	63.9	0.00100	0.3	8.83186	63.6	1.19447
.0081	8.83348	63.8	.00101		8.83250	63.5	.19472
.0082	8.83412	63.7	.00101		8.83314	63.4	.19497
.0083	8.83476	63.6	.00101		8.83378	63.3	.19522
.0084	8.83539	63.5	.00102		8.83442	63.2	.19547
0.0085	8.83603	63.4	0.00102	0.3	8.83506	63.1	1.19562
.0086	8.83666	63.3	.00102		8.83570	63.0	.19587
.0087	8.83730	63.2	.00102		8.83634	62.9	.19612
.0088	8.83793	63.1	.00103		8.83698	62.8	.19637
.0089	8.83857	63.0	.00103		8.83762	62.7	.19662
0.0090	8.83920	62.9	0.00103	0.3	8.83826	62.6	1.19677
.0091	8.83984	62.8	.00104		8.83890	62.5	.19702
.0092	8.84047	62.7	.00104		8.83954	62.4	.19727
.0093	8.84111	62.6	.00104		8.84018	62.3	.19752
.0094	8.84174	62.5	.00105		8.84082	62.2	.19777
0.0095	8.84238	62.4	0.00105	0.3	8.84146	62.1	1.19792
.0096	8.84301	62.3	.00105		8.84210	62.0	.19817
.0097	8.84365	62.2	.00105		8.84274	61.9	.19842
.0098	8.84428	62.1	.00106		8.84338	61.8	.19867
.0099	8.84492	62.0	.00106		8.84402	61.7	.19892
0.0100	8.84555	61.9	0.00106	0.3	8.84466	61.6	1.19907
u	$\log \tanh u$	$= F_4'$	$\log \operatorname{sech} u$				

Logarithms of Hyperbolic Functions.

u	log sinh u	= F ₁ '	log cosh u	= F ₂ '	log tanh u	= F ₃ '	log coth u
0.0700	8.84545	62.1	0.00105	0.3	8.84439	61.8	1.15561
.0701	8.84597	62.1	.00107		8.84501	61.8	1.15600
.0702	8.84650	62.0	.00107		8.84562	61.7	1.15638
.0703	8.84703	61.9	.00107		8.84624	61.6	1.15676
.0704	8.84756	61.8	.00108		8.84686	61.5	1.15714
0.0705	8.84815	61.7	0.00108	0.3	8.84747	61.4	1.15753
.0706	8.84871	61.6	.00108		8.84808	61.3	1.15792
.0707	8.84928	61.5	.00108		8.84870	61.2	1.15830
.0708	8.84980	61.4	.00109		8.84931	61.1	1.15869
.0709	8.85031	61.4	.00109		8.84992	61.0	1.15908
0.0710	8.85102	61.3	0.00109	0.3	8.85053	61.0	1.15947
.0711	8.85224	61.2	.00110		8.85114	60.9	1.15985
.0712	8.85285	61.1	.00110		8.85175	60.8	1.16025
.0713	8.85346	61.0	.00110		8.85235	60.7	1.16065
.0714	8.85407	60.9	.00111		8.85296	60.6	1.16104
0.0715	8.85468	60.8	0.00111	0.3	8.85357	60.5	1.16143
.0716	8.85529	60.8	.00111		8.85417	60.4	1.16183
.0717	8.85589	60.7	.00112		8.85478	60.4	1.16222
.0718	8.85650	60.6	.00112		8.85538	60.3	1.16262
.0719	8.85710	60.5	.00112		8.85598	60.2	1.16302
0.0720	8.85771	60.4	0.00112	0.3	8.85658	60.1	1.16342
.0721	8.85831	60.3	.00113		8.85718	60.0	1.16382
.0722	8.85891	60.3	.00113		8.85778	59.9	1.16422
.0723	8.85952	60.2	.00113		8.85838	59.9	1.16462
.0724	8.86012	60.1	.00114		8.85898	59.8	1.16502
0.0725	8.86072	60.0	0.00114	0.3	8.85958	59.7	1.16542
.0726	8.86132	59.9	.00114		8.86017	59.6	1.16583
.0727	8.86192	59.8	.00115		8.86077	59.5	1.16623
.0728	8.86252	59.8	.00115		8.86137	59.5	1.16663
.0729	8.86311	59.7	.00115		8.86196	59.4	1.16704
0.0730	8.86371	59.6	0.00116	0.3	8.86255	59.3	1.16745
.0731	8.86430	59.5	.00116		8.86314	59.2	1.16786
.0732	8.86490	59.4	.00116		8.86374	59.1	1.16826
.0733	8.86549	59.4	.00117		8.86433	59.0	1.16867
.0734	8.86609	59.3	.00117		8.86492	59.0	1.16908
0.0735	8.86668	59.2	0.00117	0.3	8.86551	58.9	1.16949
.0736	8.86727	59.1	.00118		8.86609	58.8	1.16990
.0737	8.86786	59.0	.00118		8.86668	58.7	1.17031
.0738	8.86845	59.0	.00118		8.86727	58.6	1.17072
.0739	8.86904	58.9	.00118		8.86786	58.6	1.17113
0.0740	8.86963	58.8	0.00119	0.3	8.86844	58.5	1.17154
.0741	8.87022	58.7	.00119		8.86902	58.4	1.17195
.0742	8.87080	58.6	.00119		8.86961	58.3	1.17236
.0743	8.87139	58.5	.00120		8.87019	58.2	1.17277
.0744	8.87197	58.5	.00120		8.87077	58.2	1.17318
0.0745	8.87256	58.4	0.00120	0.3	8.87135	58.1	1.17359
.0746	8.87314	58.3	.00121		8.87193	58.0	1.17400
.0747	8.87372	58.2	.00121		8.87251	57.9	1.17441
.0748	8.87431	58.2	.00121		8.87309	57.8	1.17482
.0749	8.87489	58.1	.00122		8.87367	57.8	1.17523
0.0750	8.87547	58.0	0.00122	0.3	8.87425	57.7	1.17565
u	log tanh u	= F ₁ '	log coth u	= F ₂ '	log sin u	= F ₃ '	log cos u

Logarithms of Hyperbolic Functions.

u	log sinh u	= F'	log cosh u	= F'	log tanh u	= F'	log coth u
0.0750	8.87547	57.0	0.00122	0.3	8.87415	57.7	1.12575
.0751	.87605	57.0	.00122		.87482	57.6	1.12518
.0752	.87663	57.0	.00123		.87540	57.5	1.12460
.0753	.87721	57.8	.00123		.87598	57.5	1.12402
.0754	.87778	57.7	.00123		.87655	57.4	1.12345
0.0755	8.87836	57.6	0.00124	0.3	8.87712	57.3	1.12288
.0756	.87894	57.6	.00124		.87770	57.2	1.12230
.0757	.87951	57.5	.00124		.87827	57.2	1.12173
.0758	.88009	57.4	.00125		.87884	57.1	1.12116
.0759	.88066	57.3	.00125		.87941	57.0	1.12059
0.0760	8.88123	57.3	0.00125	0.3	8.87998	56.9	1.12002
.0761	.88180	57.2	.00126		.88055	56.8	1.11945
.0762	.88238	57.1	.00126		.88112	56.8	1.11888
.0763	.88295	57.0	.00126		.88169	56.7	1.11831
.0764	.88352	57.0	.00127		.88225	56.6	1.11775
0.0765	8.88408	56.9	0.00127	0.3	8.88465	56.5	1.11718
.0766	.88465	56.8	.00127		.88523	56.5	1.11662
.0767	.88522	56.7	.00128		.88580	56.4	1.11605
.0768	.88579	56.7	.00128		.88637	56.3	1.11549
.0769	.88635	56.6	.00128		.88694	56.3	1.11492
0.0770	8.88692	56.5	0.00129	0.3	8.88749	56.2	1.11435
.0771	.88748	56.4	.00129		.88806	56.1	1.11379
.0772	.88805	56.4	.00129		.88863	56.0	1.11322
.0773	.88861	56.3	.00130		.88920	56.0	1.11265
.0774	.88917	56.2	.00130		.88977	55.9	1.11208
0.0775	8.88974	56.2	0.00130	0.3	8.88931	55.8	1.11151
.0776	.89030	56.1	.00131		.89088	55.7	1.11094
.0777	.89086	56.0	.00131		.89145	55.7	1.11038
.0778	.89142	55.9	.00131		.89202	55.6	1.10981
.0779	.89198	55.9	.00132		.89259	55.5	1.10924
0.0780	8.89253	55.8	0.00132	0.3	8.89210	55.5	1.10868
.0781	.89309	55.7	.00132		.89267	55.4	1.10811
.0782	.89365	55.6	.00133		.89324	55.3	1.10754
.0783	.89421	55.6	.00133		.89381	55.2	1.10698
.0784	.89476	55.5	.00133		.89438	55.2	1.10641
0.0785	8.89532	55.4	0.00134	0.3	8.89489	55.1	1.10584
.0786	.89587	55.4	.00134		.89546	55.0	1.10528
.0787	.89643	55.3	.00134		.89603	55.0	1.10471
.0788	.89698	55.2	.00135		.89660	54.9	1.10414
.0789	.89753	55.2	.00135		.89717	54.8	1.10358
0.0790	8.89808	55.1	0.00135	0.3	8.89765	54.7	1.10301
.0791	.89864	55.0	.00136		.89822	54.7	1.10244
.0792	.89919	54.9	.00136		.89879	54.6	1.10188
.0793	.89975	54.9	.00136		.89936	54.5	1.10131
.0794	.90030	54.8	.00137		.89993	54.5	1.10074
0.0795	8.90085	54.7	0.00137	0.3	8.90042	54.4	1.10018
.0796	.90140	54.7	.00137		.90099	54.3	1.09961
.0797	.90195	54.6	.00138		.90156	54.3	1.09904
.0798	.90250	54.5	.00138		.90213	54.2	1.09848
.0799	.90305	54.5	.00138		.90269	54.1	1.09791
0.0800	8.90359	54.4	0.00139	0.3	8.90316	54.1	1.09734
u	log tan pt u	= F'	log sec pt u	= F'	log sin pt u	= F'	log cos pt u

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
0.0800	8.90355	54.4	0.00139	0.1	8.90216	54.4	1.00284
0.0801	.90410	54.3	.00139		.90271	54.3	.00284
0.0802	.90464	54.3	.00139		.90325	54.3	.00284
0.0803	.90518	54.2	.00139		.90379	54.2	.00284
0.0804	.90572	54.1	.00139		.90433	54.1	.00284
0.0805	8.90626	54.1	0.00141	0.1	8.90486	54.2	1.00333
0.0806	.90681	54.0	.00141	0.1	.90540	54.0	.00333
0.0807	.90734	53.9	.00141	0.1	.90594	53.9	.00333
0.0808	.90788	53.9	.00142	0.1	.90647	53.8	.00333
0.0809	.90842	53.8	.00142	0.1	.90701	53.7	.00333
0.0810	8.90896	53.7	0.00144	0.1	8.90754	53.6	1.00382
0.0811	.90951	53.7	.00144		.90807	53.6	.00382
0.0812	.91005	53.6	.00144		.90861	53.5	.00382
0.0813	.91059	53.5	.00144		.90914	53.4	.00382
0.0814	.91113	53.5	.00144		.90968	53.4	.00382
0.0815	8.91167	53.4	0.00146	0.1	8.91020	53.3	1.00430
0.0816	.91221	53.3	.00146		.91074	53.3	.00430
0.0817	.91275	53.3	.00146		.91127	53.2	.00430
0.0818	.91329	53.2	.00146		.91181	53.1	.00430
0.0819	.91383	53.1	.00146		.91234	53.0	.00430
0.0820	8.91437	53.1	0.00148	0.1	8.91288	52.9	1.00478
0.0821	.91491	53.0	.00148		.91342	52.9	.00478
0.0822	.91545	52.9	.00148		.91395	52.8	.00478
0.0823	.91599	52.8	.00148		.91449	52.7	.00478
0.0824	.91653	52.8	.00148		.91502	52.6	.00478
0.0825	8.91707	52.7	0.00148	0.1	8.91556	52.5	1.00526
0.0826	.91761	52.7	.00148		.91609	52.4	.00526
0.0827	.91815	52.6	.00148		.91663	52.3	.00526
0.0828	.91869	52.6	.00149		.91716	52.2	.00526
0.0829	.91923	52.5	.00149		.91770	52.1	.00526
0.0830	8.91977	52.4	0.00149	0.1	8.91824	52.0	1.00574
0.0831	.92031	52.4	.00150		.91877	51.9	.00574
0.0832	.92085	52.3	.00150		.91931	51.8	.00574
0.0833	.92139	52.3	.00151		.91984	51.7	.00574
0.0834	.92193	52.2	.00151		.92038	51.6	.00574
0.0835	8.92247	52.1	0.00151	0.1	8.92091	51.5	1.00622
0.0836	.92301	52.1	.00151		.92145	51.4	.00622
0.0837	.92355	52.0	.00152		.92198	51.3	.00622
0.0838	.92409	51.9	.00152		.92252	51.2	.00622
0.0839	.92463	51.9	.00153		.92305	51.1	.00622
0.0840	8.92517	51.8	0.00153	0.1	8.92359	51.0	1.00670
0.0841	.92571	51.8	.00153		.92412	50.9	.00670
0.0842	.92625	51.7	.00153		.92466	50.8	.00670
0.0843	.92679	51.6	.00154		.92519	50.7	.00670
0.0844	.92733	51.6	.00154		.92573	50.6	.00670
0.0845	8.92787	51.5	0.00155	0.1	8.92626	50.5	1.00718
0.0846	.92841	51.5	.00155		.92680	50.4	.00718
0.0847	.92895	51.4	.00155		.92733	50.3	.00718
0.0848	.92949	51.3	.00155		.92787	50.2	.00718
0.0849	.93003	51.3	.00155		.92840	50.1	.00718
0.0850	8.93057	51.2	0.00157	0.1	8.92894	50.0	1.00766
u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \sinh u$	$= F_3'$	$\log \cosh u$

Logarithm of Hyperbolic Functions.

x	$\log \sinh x$	$x \cdot 10^2$	$\log \cosh x$	$x \cdot 10^2$	$\log \tanh x$	$x \cdot 10^2$	$\log \coth x$
0.0000	8.000000	0.0	0.000000	0.0	8.000000	0.0	1.000000
0.0001	0.000000	0.1	0.000000	0.1	0.000000	0.1	0.000000
0.0002	0.000000	0.2	0.000000	0.2	0.000000	0.2	0.000000
0.0003	0.000000	0.3	0.000000	0.3	0.000000	0.3	0.000000
0.0004	0.000000	0.4	0.000000	0.4	0.000000	0.4	0.000000
0.0005	8.000000	0.5	0.000000	0.5	8.000000	0.5	1.000000
0.0006	0.000000	0.6	0.000000	0.6	0.000000	0.6	0.000000
0.0007	0.000000	0.7	0.000000	0.7	0.000000	0.7	0.000000
0.0008	0.000000	0.8	0.000000	0.8	0.000000	0.8	0.000000
0.0009	0.000000	0.9	0.000000	0.9	0.000000	0.9	0.000000
0.0010	8.000000	1.0	0.000000	1.0	8.000000	1.0	1.000000
0.0011	0.000000	1.1	0.000000	1.1	0.000000	1.1	0.000000
0.0012	0.000000	1.2	0.000000	1.2	0.000000	1.2	0.000000
0.0013	0.000000	1.3	0.000000	1.3	0.000000	1.3	0.000000
0.0014	8.000000	1.4	0.000000	1.4	8.000000	1.4	1.000000
0.0015	0.000000	1.5	0.000000	1.5	0.000000	1.5	0.000000
0.0016	0.000000	1.6	0.000000	1.6	0.000000	1.6	0.000000
0.0017	0.000000	1.7	0.000000	1.7	0.000000	1.7	0.000000
0.0018	0.000000	1.8	0.000000	1.8	0.000000	1.8	0.000000
0.0019	0.000000	1.9	0.000000	1.9	0.000000	1.9	0.000000
0.0020	8.000000	2.0	0.000000	2.0	8.000000	2.0	1.000000
0.0021	0.000000	2.1	0.000000	2.1	0.000000	2.1	0.000000
0.0022	0.000000	2.2	0.000000	2.2	0.000000	2.2	0.000000
0.0023	0.000000	2.3	0.000000	2.3	0.000000	2.3	0.000000
0.0024	0.000000	2.4	0.000000	2.4	0.000000	2.4	0.000000
0.0025	8.000000	2.5	0.000000	2.5	8.000000	2.5	1.000000
0.0026	0.000000	2.6	0.000000	2.6	0.000000	2.6	0.000000
0.0027	0.000000	2.7	0.000000	2.7	0.000000	2.7	0.000000
0.0028	0.000000	2.8	0.000000	2.8	0.000000	2.8	0.000000
0.0029	0.000000	2.9	0.000000	2.9	0.000000	2.9	0.000000
0.0030	8.000000	3.0	0.000000	3.0	8.000000	3.0	1.000000
0.0031	0.000000	3.1	0.000000	3.1	0.000000	3.1	0.000000
0.0032	0.000000	3.2	0.000000	3.2	0.000000	3.2	0.000000
0.0033	0.000000	3.3	0.000000	3.3	0.000000	3.3	0.000000
0.0034	0.000000	3.4	0.000000	3.4	0.000000	3.4	0.000000
0.0035	8.000000	3.5	0.000000	3.5	8.000000	3.5	1.000000
0.0036	0.000000	3.6	0.000000	3.6	0.000000	3.6	0.000000
0.0037	0.000000	3.7	0.000000	3.7	0.000000	3.7	0.000000
0.0038	0.000000	3.8	0.000000	3.8	0.000000	3.8	0.000000
0.0039	0.000000	3.9	0.000000	3.9	0.000000	3.9	0.000000
0.0040	8.000000	4.0	0.000000	4.0	8.000000	4.0	1.000000
0.0041	0.000000	4.1	0.000000	4.1	0.000000	4.1	0.000000
0.0042	0.000000	4.2	0.000000	4.2	0.000000	4.2	0.000000
0.0043	0.000000	4.3	0.000000	4.3	0.000000	4.3	0.000000
0.0044	0.000000	4.4	0.000000	4.4	0.000000	4.4	0.000000
0.0045	8.000000	4.5	0.000000	4.5	8.000000	4.5	1.000000
0.0046	0.000000	4.6	0.000000	4.6	0.000000	4.6	0.000000
0.0047	0.000000	4.7	0.000000	4.7	0.000000	4.7	0.000000
0.0048	0.000000	4.8	0.000000	4.8	0.000000	4.8	0.000000
0.0049	0.000000	4.9	0.000000	4.9	0.000000	4.9	0.000000
0.0050	8.000000	5.0	0.000000	5.0	8.000000	5.0	1.000000
0.0051	0.000000	5.1	0.000000	5.1	0.000000	5.1	0.000000
0.0052	0.000000	5.2	0.000000	5.2	0.000000	5.2	0.000000
0.0053	0.000000	5.3	0.000000	5.3	0.000000	5.3	0.000000
0.0054	0.000000	5.4	0.000000	5.4	0.000000	5.4	0.000000
0.0055	8.000000	5.5	0.000000	5.5	8.000000	5.5	1.000000
0.0056	0.000000	5.6	0.000000	5.6	0.000000	5.6	0.000000
0.0057	0.000000	5.7	0.000000	5.7	0.000000	5.7	0.000000
0.0058	0.000000	5.8	0.000000	5.8	0.000000	5.8	0.000000
0.0059	0.000000	5.9	0.000000	5.9	0.000000	5.9	0.000000
0.0060	8.000000	6.0	0.000000	6.0	8.000000	6.0	1.000000
0.0061	0.000000	6.1	0.000000	6.1	0.000000	6.1	0.000000
0.0062	0.000000	6.2	0.000000	6.2	0.000000	6.2	0.000000
0.0063	0.000000	6.3	0.000000	6.3	0.000000	6.3	0.000000
0.0064	0.000000	6.4	0.000000	6.4	0.000000	6.4	0.000000
0.0065	8.000000	6.5	0.000000	6.5	8.000000	6.5	1.000000
0.0066	0.000000	6.6	0.000000	6.6	0.000000	6.6	0.000000
0.0067	0.000000	6.7	0.000000	6.7	0.000000	6.7	0.000000
0.0068	0.000000	6.8	0.000000	6.8	0.000000	6.8	0.000000
0.0069	0.000000	6.9	0.000000	6.9	0.000000	6.9	0.000000
0.0070	8.000000	7.0	0.000000	7.0	8.000000	7.0	1.000000
0.0071	0.000000	7.1	0.000000	7.1	0.000000	7.1	0.000000
0.0072	0.000000	7.2	0.000000	7.2	0.000000	7.2	0.000000
0.0073	0.000000	7.3	0.000000	7.3	0.000000	7.3	0.000000
0.0074	0.000000	7.4	0.000000	7.4	0.000000	7.4	0.000000
0.0075	8.000000	7.5	0.000000	7.5	8.000000	7.5	1.000000
0.0076	0.000000	7.6	0.000000	7.6	0.000000	7.6	0.000000
0.0077	0.000000	7.7	0.000000	7.7	0.000000	7.7	0.000000
0.0078	0.000000	7.8	0.000000	7.8	0.000000	7.8	0.000000
0.0079	0.000000	7.9	0.000000	7.9	0.000000	7.9	0.000000
0.0080	8.000000	8.0	0.000000	8.0	8.000000	8.0	1.000000
0.0081	0.000000	8.1	0.000000	8.1	0.000000	8.1	0.000000
0.0082	0.000000	8.2	0.000000	8.2	0.000000	8.2	0.000000
0.0083	0.000000	8.3	0.000000	8.3	0.000000	8.3	0.000000
0.0084	0.000000	8.4	0.000000	8.4	0.000000	8.4	0.000000
0.0085	8.000000	8.5	0.000000	8.5	8.000000	8.5	1.000000
0.0086	0.000000	8.6	0.000000	8.6	0.000000	8.6	0.000000
0.0087	0.000000	8.7	0.000000	8.7	0.000000	8.7	0.000000
0.0088	0.000000	8.8	0.000000	8.8	0.000000	8.8	0.000000
0.0089	0.000000	8.9	0.000000	8.9	0.000000	8.9	0.000000
0.0090	8.000000	9.0	0.000000	9.0	8.000000	9.0	1.000000
0.0091	0.000000	9.1	0.000000	9.1	0.000000	9.1	0.000000
0.0092	0.000000	9.2	0.000000	9.2	0.000000	9.2	0.000000
0.0093	0.000000	9.3	0.000000	9.3	0.000000	9.3	0.000000
0.0094	0.000000	9.4	0.000000	9.4	0.000000	9.4	0.000000
0.0095	8.000000	9.5	0.000000	9.5	8.000000	9.5	1.000000
0.0096	0.000000	9.6	0.000000	9.6	0.000000	9.6	0.000000
0.0097	0.000000	9.7	0.000000	9.7	0.000000	9.7	0.000000
0.0098	0.000000	9.8	0.000000	9.8	0.000000	9.8	0.000000
0.0099	0.000000	9.9	0.000000	9.9	0.000000	9.9	0.000000
0.0100	8.000000	10.0	0.000000	10.0	8.000000	10.0	1.000000
x	$\log \sinh x$	$x \cdot 10^2$	$\log \cosh x$	$x \cdot 10^2$	$\log \tanh x$	$x \cdot 10^2$	$\log \coth x$

Logarithms of Hyperbolic Functions.

u	log sinh u	= F ₁ '	log cosh u	= F ₂ '	log tanh u	= F ₃ '	log coth u
0.0000	8.95493	48.1	0.00170	0.1	8.95507	48.0	1.000
.0001	.95511	48.1	.00170		.95515	47.9	.001
.0002	.95529	48.1	.00170		.95533	47.9	.002
.0003	.95548	48.2	.00177		.95552	47.8	.003
.0004	.95566	48.2	.00177		.95570	47.8	.004
0.0005	8.95734	48.1	0.00178	0.1	8.95747	47.7	1.001
.0006	.95772	48.1	.00178		.95791	47.7	.001
.0007	.95820	48.0	.00178		.95842	47.6	.002
.0008	.95868	48.0	.00179		.95893	47.6	.003
.0009	.95916	47.9	.00179		.95947	47.5	.004
0.0010	8.95964	47.9	0.00180	0.1	8.95974	47.5	1.002
.0011	.96012	47.8	.00180		.96032	47.4	.001
.0012	.96060	47.8	.00180		.96080	47.4	.002
.0013	.96107	47.7	.00181		.96127	47.3	.003
.0014	.96155	47.6	.00181		.96174	47.3	.004
0.0015	8.96203	47.6	0.00182	0.1	8.96211	47.3	1.003
.0016	.96250	47.5	.00182		.96268	47.3	.001
.0017	.96298	47.5	.00182		.96315	47.3	.002
.0018	.96345	47.4	.00183		.96363	47.2	.003
.0019	.96393	47.4	.00183		.96410	47.2	.004
0.0020	8.96440	47.3	0.00184	0.1	8.96450	47.2	1.004
.0021	.96487	47.3	.00184		.96504	47.1	.001
.0022	.96535	47.2	.00184		.96559	47.1	.002
.0023	.96582	47.2	.00185		.96607	47.0	.003
.0024	.96629	47.1	.00185		.96654	47.0	.004
0.0025	8.96676	47.1	0.00186	0.1	8.96691	46.9	1.005
.0026	.96723	47.0	.00186		.96747	46.9	.001
.0027	.96770	47.0	.00186		.96794	46.9	.002
.0028	.96817	46.9	.00187		.96841	46.8	.003
.0029	.96864	46.9	.00187		.96887	46.8	.004
0.0030	8.96911	46.8	0.00188	0.1	8.96924	46.8	1.006
.0031	.96958	46.8	.00188		.96979	46.7	.001
.0032	.97004	46.7	.00188		.97026	46.7	.002
.0033	.97051	46.7	.00189		.97071	46.6	.003
.0034	.97098	46.6	.00189		.97119	46.6	.004
0.0035	8.97144	46.6	0.00190	0.1	8.97155	46.5	1.007
.0036	.97191	46.5	.00190		.97211	46.5	.001
.0037	.97237	46.5	.00190		.97257	46.4	.002
.0038	.97284	46.4	.00191		.97303	46.4	.003
.0039	.97330	46.4	.00191		.97349	46.3	.004
0.0040	8.97377	46.3	0.00192	0.1	8.97385	46.3	1.008
.0041	.97423	46.3	.00192		.97443	46.2	.001
.0042	.97469	46.2	.00192		.97487	46.2	.002
.0043	.97516	46.2	.00193		.97534	46.1	.003
.0044	.97562	46.1	.00193		.97580	46.1	.004
0.0045	8.97608	46.1	0.00194	0.1	8.97614	46.0	1.009
.0046	.97654	46.0	.00194		.97673	45.9	.001
.0047	.97700	46.0	.00194		.97719	45.9	.002
.0048	.97746	45.9	.00195		.97764	45.8	.003
.0049	.97792	45.9	.00195		.97810	45.8	.004
0.0050	8.97838	45.9	0.00196	0.1	8.97842	45.7	1.010
u	log tanh u	= F ₁ '	log coth u	= F ₂ '	log sinh u	= F ₃ '	log cosh u

Logarithms of Hyperbolic Functions.

u	log sinh u	= F ₁ '	log cosh u	= F ₂ '	log tanh u	= F ₃ '	log coth u
0.0050	8.07838	45.9	0.00195	0.4	8.07642	45.1	1.02388
0.0051	.07883	45.8	.00196		.07687	45.1	.02313
0.0052	.07929	45.8	.00197		.07733	45.1	.02267
0.0053	.07975	45.7	.00197		.07778	45.1	.02222
0.0054	.08021	45.7	.00197		.07823	45.2	.02177
0.0055	8.08066	45.6	0.00198	0.4	8.07869	45.2	1.02131
0.0056	.08112	45.6	.00198		.07914	45.2	.02086
0.0057	.08157	45.5	.00198		.07959	45.1	.02041
0.0058	.08203	45.5	.00199		.08004	45.1	.01996
0.0059	.08248	45.4	.00199		.08049	45.0	.01951
0.0060	8.08293	45.4	0.00200	0.4	8.08094	45.0	1.01906
0.0061	.08339	45.3	.00200		.08139	44.9	.01861
0.0062	.08384	45.3	.00201		.08184	44.9	.01816
0.0063	.08430	45.2	.00201		.08229	44.8	.01771
0.0064	.08475	45.2	.00201		.08273	44.8	.01727
0.0065	8.08520	45.1	0.00202	0.4	8.08318	44.7	1.01682
0.0066	.08565	45.1	.00202		.08363	44.7	.01637
0.0067	.08610	45.1	.00203		.08408	44.6	.01592
0.0068	.08655	45.0	.00203		.08452	44.6	.01548
0.0069	.08700	45.0	.00203		.08497	44.5	.01503
0.0070	8.08745	44.9	0.00204	0.4	8.08541	44.5	1.01459
0.0071	.08790	44.9	.00204		.08586	44.5	.01414
0.0072	.08835	44.8	.00205		.08630	44.4	.01370
0.0073	.08880	44.8	.00205		.08675	44.4	.01325
0.0074	.08925	44.7	.00205		.08719	44.3	.01281
0.0075	8.08970	44.7	0.00205	0.4	8.08913	44.3	1.01237
0.0076	.09014	44.6	.00207		.08957	44.2	.01193
0.0077	.09059	44.6	.00207		.08999	44.2	.01148
0.0078	.09103	44.5	.00207		.09040	44.1	.01104
0.0079	.09148	44.5	.00208		.09080	44.1	.01060
0.0080	8.09193	44.5	0.00208	0.4	8.09183	44.0	1.01016
0.0081	.09237	44.4	.00209		.09224	44.0	.00972
0.0082	.09281	44.4	.00209		.09267	43.9	.00928
0.0083	.09325	44.3	.00209		.09310	43.9	.00884
0.0084	.09370	44.3	.00210		.09350	43.9	.00840
0.0085	8.09414	44.2	0.00210	0.4	8.09403	43.8	1.00797
0.0086	.09458	44.2	.00211		.09447	43.8	.00753
0.0087	.09502	44.2	.00211		.09491	43.7	.00709
0.0088	.09546	44.1	.00212		.09535	43.7	.00665
0.0089	.09590	44.1	.00212		.09578	43.6	.00622
0.0090	8.09634	44.0	0.00212	0.4	8.09622	43.6	1.00578
0.0091	.09678	44.0	.00213		.09666	43.5	.00534
0.0092	.09722	43.9	.00213		.09709	43.5	.00491
0.0093	.09766	43.9	.00214		.09753	43.4	.00447
0.0094	.09810	43.8	.00214		.09796	43.4	.00404
0.0095	8.09854	43.8	0.00215	0.4	8.09842	43.4	1.00361
0.0096	.09898	43.7	.00215		.09883	43.3	.00317
0.0097	.09941	43.7	.00215		.09926	43.3	.00274
0.0098	.09985	43.7	.00216		.09970	43.2	.00231
0.0099	9.00029	43.6	.00216		.09912	43.2	.00188
0.0000	9.00072	43.6	0.00217	0.4	8.99986	43.1	1.00144
u	log tan gd u	= F ₄ '	log sec gd u	= F ₅ '	log sin gd u	= F ₆ '	log cos gd u

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
0.100	0.00072	435.7	0.00217	4.3	8.00859	-4.1	8.00814
.101	.00090	434.3	.00221	4.4	8.00885	-4.2	8.00875
.102	.00115	432.3	.00226	4.4	.00780	-4.2	.00810
.103	.01330	431.4	.00230	4.5	.01131	-4.2	.00899
.104	.01582	430.1	.00231	4.5	.01547	-4.1	.00853
0.105	0.02199	415.1	0.00239	4.5	0.01960	-4.0	0.02810
.106	.02612	411.2	.00244	4.6	.02368	-4.0	.02732
.107	.03031	407.4	.00248	4.6	.02771	-4.0	.02727
.108	.03447	403.7	.00253	4.7	.03174	-3.9	.02850
.109	.03859	400.0	.00257	4.7	.03571	-3.9	.02849
0.110	0.04277	395.4	0.00262	4.8	0.03966	-3.9	0.02903
.111	.04691	391.9	.00267	4.8	.04351	-3.8	.02916
.112	.05103	388.4	.00272	4.8	.04741	-3.8	.02939
.113	.05500	385.0	.00277	4.9	.05124	-3.8	.02970
.114	.05895	382.0	.00282	4.9	.05503	-3.7	.02997
0.115	0.06265	379.3	0.00287	5.0	0.05879	-3.7	0.03042
.116	.06633	375.1	.00292	5.0	.06252	-3.7	.03048
.117	.06998	372.0	.00297	5.1	.06621	-3.7	.03070
.118	.07359	369.4	.00302	5.1	.06987	-3.6	.03083
.119	.07717	366.7	.00307	5.1	.07350	-3.6	.03080
0.120	0.08072	363.6	0.00312	5.2	0.07710	-3.6	0.03120
.121	.08424	360.7	.00317	5.2	.08067	-3.5	.03124
.122	.08774	357.7	.00322	5.3	.08421	-3.5	.03151
.123	.09120	354.9	.00328	5.3	.08772	-3.5	.03159
.124	.09453	352.0	.00333	5.4	.09120	-3.4	.03180
0.125	0.09804	349.2	0.00338	5.4	0.09466	-3.4	0.03214
.126	.10152	345.3	.00344	5.4	.09808	-3.4	.03202
.127	.10497	342.8	.00349	5.5	.10148	-3.4	.03232
.128	.10840	340.1	.00355	5.5	.10485	-3.3	.03245
.129	.11179	338.5	.00360	5.6	.10819	-3.3	.03281
0.130	0.11517	335.0	0.00366	5.6	0.11151	-3.3	0.03339
.131	.11851	332.4	.00372	5.7	.11480	-3.2	.03350
.132	.12183	329.9	.00377	5.7	.11806	-3.2	.03361
.133	.12513	328.5	.00383	5.7	.12130	-3.2	.03380
.134	.12840	326.0	.00389	5.8	.12452	-3.2	.03388
0.135	0.13165	323.7	0.00395	5.8	0.12771	-3.2	0.03429
.136	.13488	321.3	.00400	5.9	.13087	-3.1	.03433
.137	.13808	319.0	.00406	5.9	.13400	-3.1	.03458
.138	.14125	316.7	.00412	6.0	.13713	-3.1	.03487
.139	.14441	314.5	.00418	6.0	.14023	-3.0	.03497
0.140	0.14755	312.2	0.00424	6.0	0.14330	-3.0	0.03519
.141	.15066	310.0	.00430	6.1	.14635	-3.0	.03535
.142	.15375	307.9	.00436	6.1	.14938	-3.0	.03562
.143	.15682	305.8	.00443	6.2	.15239	-2.9	.03571
.144	.15986	303.7	.00449	6.2	.15538	-2.9	.03592
0.145	0.16289	301.6	0.00455	6.2	0.15834	-2.9	0.03616
.146	.16588	299.6	.00461	6.3	.16128	-2.9	.03672
.147	.16888	297.6	.00468	6.3	.16420	-2.9	.03680
.148	.17184	295.6	.00474	6.4	.16711	-2.8	.03686
.149	.17479	293.6	.00480	6.4	.16999	-2.8	.03691
0.150	0.17772	291.7	0.00487	6.5	0.17285	-2.8	0.03715
u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$

BRITISH TABLES

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$\equiv F'_1$	$\log \cosh u$	$\equiv F'_2$	$\log \tanh u$	$\equiv F'_3$	$\log \coth u$
0.150	0.17772	296.7	0.01187	6.5	9.17285	285.2	0.112715
.151	.17803	296.8	.01193	6.5	.17299	285.3	.82131
.152	.17835	296.9	.01199	6.6	.17312	285.4	.82148
.153	.17868	297.0	.01206	6.6	.17324	279.5	.81888
.154	.17901	297.1	.01213	6.6	.17337	277.6	.81386
0.155	0.17937	297.2	0.01220	6.7	9.18389	275.8	0.81213
.156	.17968	297.3	.01226	6.7	.18400	273.9	.81038
.157	.17998	297.4	.01233	6.8	.18412	272.1	.80765
.158	.18030	277.5	.01240	6.8	.18425	270.3	.80491
.159	.18062	275.6	.01247	6.8	.18437	268.5	.80214
0.160	0.18097	273.7	0.01254	6.9	9.20044	266.7	0.79986
.161	.18127	273.8	.01260	6.9	.20056	264.8	.79709
.162	.18158	273.9	.01267	7.0	.20068	263.0	.79431
.163	.18189	274.0	.01274	7.0	.20080	261.2	.79153
.164	.18220	274.1	.01281	7.1	.20092	259.4	.78875
0.165	0.18255	276.6	0.01288	7.1	9.21357	257.5	0.78641
.166	.18286	276.7	.01295	7.1	.21369	255.7	.78364
.167	.18317	276.8	.01302	7.2	.21381	253.8	.78086
.168	.18348	276.9	.01309	7.2	.21393	252.0	.77808
.169	.18379	277.0	.01316	7.3	.21405	250.2	.77531
0.170	0.18415	277.0	0.01323	7.3	9.22629	248.3	0.77297
.171	.18446	277.1	.01330	7.4	.22640	246.5	.77020
.172	.18477	277.2	.01337	7.4	.22652	244.6	.76742
.173	.18508	277.3	.01344	7.4	.22664	242.8	.76465
.174	.18539	277.4	.01351	7.5	.22676	240.9	.76187
0.175	0.18575	279.7	0.01358	7.5	9.23866	239.0	0.75953
.176	.18606	279.8	.01365	7.6	.23877	237.2	.75675
.177	.18637	279.9	.01372	7.6	.23889	235.3	.75397
.178	.18668	280.0	.01379	7.6	.23901	233.5	.75119
.179	.18699	280.1	.01386	7.7	.23913	231.6	.74841
0.180	0.18735	282.0	0.01393	7.7	9.25062	229.7	0.74607
.181	.18766	282.1	.01400	7.8	.25073	227.9	.74329
.182	.18797	282.2	.01407	7.8	.25085	226.0	.74051
.183	.18828	282.3	.01414	7.9	.25097	224.2	.73773
.184	.18859	282.4	.01421	7.9	.25109	222.3	.73495
0.185	0.18895	282.4	0.01428	7.9	9.26265	220.4	0.73261
.186	.18926	282.5	.01435	8.0	.26276	218.6	.72983
.187	.18957	282.6	.01442	8.0	.26288	216.7	.72705
.188	.18988	282.7	.01449	8.1	.26300	214.9	.72427
.189	.19019	282.8	.01456	8.1	.26312	213.0	.72149
0.190	0.19055	282.8	0.01463	8.2	9.27357	211.2	0.71915
.191	.19086	282.9	.01470	8.2	.27369	209.3	.71637
.192	.19117	283.0	.01477	8.2	.27381	207.5	.71359
.193	.19148	283.1	.01484	8.3	.27393	205.6	.71081
.194	.19179	283.2	.01491	8.3	.27405	203.8	.70803
0.195	0.19215	285.5	0.01498	8.4	9.28458	201.9	0.70569
.196	.19246	285.6	.01505	8.4	.28470	200.1	.70291
.197	.19277	285.7	.01512	8.4	.28482	198.2	.70013
.198	.19308	285.8	.01519	8.5	.28494	196.4	.69735
.199	.19339	285.9	.01526	8.5	.28506	194.5	.69457
0.200	0.19375	288.0	0.01533	8.6	9.29539	192.6	0.69223
u	$\log \sinh u$	$\equiv F'_1$	$\log \cosh u$	$\equiv F'_2$	$\log \tanh u$	$\equiv F'_3$	$\log \coth u$

Logarithms of Hyperbolic Functions.

u	log sinh u	= F'	log cosh u	= F'	log tanh u	= F'	log coth u
0.200	9.30392	220.0	0.00851	8.6	9.20520	211.5	0.70471
.201	.30612	220.0	.00871	8.6	.20740	210.4	.70260
.202	.30830	217.0	.00880	8.7	.20950	209.3	.70050
.203	.31047	216.0	.00889	8.7	.20150	208.2	.69841
.204	.31264	215.0	.00897	8.7	.20360	207.1	.69634
0.205	9.31479	214.8	0.00905	8.8	9.30573	206.0	0.69427
.206	.31693	213.8	.00915	8.8	.20778	205.0	.69222
.207	.31907	212.8	.00924	8.9	.20983	203.9	.69017
.208	.32119	211.8	.00933	8.9	.21188	202.9	.68814
.209	.32330	210.8	.00942	8.9	.21389	201.0	.68611
0.210	9.32541	209.8	0.00951	9.0	9.31590	200.8	0.68410
.211	.32750	208.0	.00950	9.0	.21790	199.8	.68210
.212	.32958	207.0	.00959	9.1	.21990	198.8	.68010
.213	.33166	206.0	.00968	9.1	.22188	197.9	.67812
.214	.33372	205.0	.00977	9.2	.22385	196.9	.67615
0.215	9.33578	205.1	0.00986	9.2	9.32582	195.9	0.67418
.216	.33783	204.2	.01005	9.2	.22777	194.9	.67223
.217	.33986	203.3	.01015	9.3	.22972	194.0	.67028
.218	.34188	202.4	.01024	9.3	.23165	193.0	.66835
.219	.34391	201.5	.01033	9.4	.23358	192.1	.66642
0.220	9.34592	200.6	0.01043	9.4	9.33549	191.2	0.66451
.221	.34792	199.7	.01052	9.4	.23740	190.3	.66260
.222	.34991	198.8	.01062	9.5	.23930	189.3	.66070
.223	.35190	198.0	.01071	9.5	.24119	188.4	.65881
.224	.35387	197.1	.01081	9.6	.24307	187.5	.65693
0.225	9.35584	196.3	0.01090	9.6	9.34494	186.7	0.65506
.226	.35780	195.4	.01100	9.7	.24680	185.8	.65320
.227	.35975	194.6	.01109	9.7	.24865	184.9	.65135
.228	.36169	193.8	.01119	9.7	.25050	184.0	.64950
.229	.36362	193.0	.01129	9.8	.25234	183.2	.64766
0.230	9.36555	192.1	0.01139	9.8	9.35416	182.3	0.64584
.231	.36747	191.3	.01149	9.9	.25608	181.5	.64402
.232	.36938	190.5	.01158	9.9	.25799	180.6	.64221
.233	.37128	189.8	.01168	9.9	.25989	179.8	.64041
.234	.37317	189.0	.01178	10.0	.26179	179.0	.63861
0.235	9.37506	188.2	0.01188	10.0	9.36317	178.2	0.63683
.236	.37694	187.4	.01198	10.1	.26505	177.4	.63505
.237	.37881	186.7	.01208	10.1	.26692	176.6	.63328
.238	.38067	185.9	.01219	10.1	.26878	175.8	.63152
.239	.38252	185.2	.01229	10.2	.27064	175.0	.62976
0.240	9.38437	184.4	0.01239	10.2	9.37198	174.2	0.62802
.241	.38621	183.7	.01249	10.3	.27372	173.4	.62628
.242	.38806	183.0	.01259	10.3	.27545	172.6	.62455
.243	.38989	182.2	.01270	10.4	.27717	171.8	.62283
.244	.39169	181.5	.01280	10.4	.27889	171.1	.62111
0.245	9.39350	180.8	0.01291	10.4	9.38060	170.4	0.61940
.246	.39533	180.1	.01301	10.5	.28230	169.6	.61770
.247	.39716	179.4	.01312	10.5	.28400	168.9	.61601
.248	.39898	178.7	.01322	10.6	.28567	168.1	.61433
.249	.40088	178.0	.01333	10.6	.28735	167.4	.61265
0.250	9.40245	177.3	0.01343	10.6	9.38902	166.7	0.61098
u	log tanh u	= F'	log coth u	= F'	log sinh u	= F'	log cosh u

SMITHSONIAN TABLE

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	u/F'	$\log \cosh u$	u/F'	$\log \tanh u$	u/F'	$\log \coth u$
0.290	0.40415	177.3	0.01343	10.6	0.39063	104.7	0.61038
.291	0.40434	176.0	0.01351	10.7	0.39089	104.0	0.61031
.292	0.40450	174.0	0.01358	10.7	0.39111	103.3	0.61024
.293	0.40474	172.3	0.01375	10.8	0.39139	102.5	0.61017
.294	0.40499	171.0	0.01380	10.8	0.39163	101.8	0.61010
0.295	0.41124	174.0	0.01397	10.8	0.39727	103.1	0.60473
.296	0.41207	173.3	0.01408	10.9	0.39830	102.5	0.60410
.297	0.41270	172.7	0.01419	10.9	0.39952	101.8	0.60348
.298	0.41343	172.0	0.01430	11.0	0.40113	101.1	0.60287
.299	0.41384	171.1	0.01441	11.0	0.40271	100.4	0.60226
0.300	0.41986	170.8	0.01452	11.0	0.40534	100.7	0.59666
.301	0.42150	170.2	0.01463	11.1	0.40693	100.1	0.59607
.302	0.42306	169.3	0.01474	11.1	0.40852	99.4	0.59548
.303	0.42458	168.0	0.01485	11.2	0.41010	98.7	0.59489
.304	0.42601	168.1	0.01496	11.2	0.41168	98.1	0.59430
0.305	0.43213	167.7	0.01507	11.2	0.41324	97.5	0.58876
.306	0.43299	167.1	0.01519	11.3	0.41380	96.8	0.58817
.307	0.43366	166.5	0.01530	11.3	0.41536	96.2	0.58758
.308	0.43432	165.9	0.01541	11.4	0.41791	95.5	0.58699
.309	0.43498	165.1	0.01553	11.4	0.41945	94.8	0.58640
0.310	0.43963	164.7	0.01564	11.4	0.42099	94.3	0.58086
.311	0.43847	164.1	0.01576	11.5	0.42252	93.7	0.58027
.312	0.43901	163.0	0.01587	11.5	0.42394	93.1	0.57968
.313	0.44154	161.0	0.01599	11.6	0.42550	92.4	0.57909
.314	0.44317	160.4	0.01610	11.6	0.42707	91.8	0.57850
0.315	0.44149	161.0	0.01622	11.7	0.42857	91.2	0.57791
.316	0.44341	161.1	0.01634	11.7	0.43007	90.6	0.57732
.317	0.44380	160.3	0.01645	11.7	0.43157	90.0	0.57673
.318	0.44562	160.2	0.01657	11.8	0.43305	89.5	0.57614
.319	0.45122	159.7	0.01669	11.8	0.43454	88.9	0.57555
0.320	0.45284	159.1	0.01681	11.9	0.43601	88.3	0.57496
.321	0.45441	158.6	0.01693	11.9	0.43748	87.7	0.57437
.322	0.45599	158.1	0.01704	11.9	0.43895	87.1	0.57378
.323	0.45757	157.3	0.01716	12.0	0.44040	86.6	0.57319
.324	0.45914	157.0	0.01728	12.0	0.44186	86.0	0.57260
0.325	0.46007	156.3	0.01740	12.1	0.44330	85.4	0.57201
.326	0.46227	156.0	0.01752	12.1	0.44475	84.8	0.57142
.327	0.46383	155.5	0.01765	12.1	0.44618	84.3	0.57083
.328	0.46538	154.0	0.01777	12.2	0.44761	83.7	0.57024
.329	0.46693	154.4	0.01789	12.2	0.44904	83.2	0.56965
0.330	0.46817	153.0	0.01801	12.3	0.45046	82.7	0.56906
.331	0.47001	153.4	0.01813	12.3	0.45187	82.1	0.56847
.332	0.47154	152.0	0.01826	12.3	0.45328	81.6	0.56788
.333	0.47301	151.4	0.01838	12.4	0.45468	81.1	0.56729
.334	0.47439	150.0	0.01851	12.4	0.45608	80.5	0.56670
0.335	0.47610	151.5	0.01863	12.5	0.45747	80.0	0.56611
.336	0.47763	151.0	0.01875	12.5	0.45886	79.5	0.56552
.337	0.47912	150.3	0.01888	12.5	0.46024	78.9	0.56493
.338	0.48063	150.0	0.01900	12.6	0.46162	78.4	0.56434
.339	0.48212	149.0	0.01913	12.6	0.46299	77.9	0.56375
0.340	0.48360	149.1	0.01926	12.7	0.46436	77.4	0.56316
u	$\log \tanh u$	u/F'	$\log \coth u$	u/F'	$\log \sinh u$	u/F'	$\log \cosh u$

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$u \text{ } ^\circ$	$\log \cosh u$	$u \text{ } ^\circ$	$\log \tanh u$	$u \text{ } ^\circ$	$\log \coth u$
0.300	9.48502	1.641	0.016930	1.57	9.468090	1.574	0.535910
.301	.48510	1.641	.016938	1.57	.46817	1.574	.535918
.302	.48519	1.642	.016945	1.57	.46825	1.574	.535927
.303	.48529	1.642	.016951	1.57	.46833	1.574	.535935
.304	.48534	1.642	.016957	1.57	.46840	1.574	.535943
0.305	9.49101	1.643	0.016960	1.57	9.47417	1.574	0.535958
.306	.49108	1.643	.016962	1.57	.47425	1.574	.535965
.307	.49111	1.643	.016965	1.57	.47429	1.574	.535968
.308	.49119	1.643	.016968	1.57	.47433	1.575	.535971
.309	.49125	1.643	.016971	1.57	.47441	1.575	.535979
0.310	9.49530	1.644	0.016975	1.57	9.47773	1.575	0.535995
.311	.49537	1.644	.016977	1.57	.47781	1.575	.536002
.312	.49543	1.644	.016980	1.57	.47785	1.575	.536005
.313	.49550	1.644	.016983	1.57	.47789	1.575	.536008
.314	.49554	1.645	.016987	1.57	.47793	1.575	.536012
0.315	9.49847	1.644	0.016989	1.57	9.47842	1.575	0.536023
.316	.49850	1.645	.016991	1.57	.47849	1.575	.536026
.317	.49853	1.645	.016993	1.57	.47851	1.575	.536028
.318	.49857	1.645	.016995	1.57	.47855	1.575	.536031
.319	.49861	1.645	.016997	1.57	.47859	1.575	.536034
0.320	9.50154	1.645	0.016999	1.57	9.47907	1.575	0.536043
.321	.50159	1.645	.017000	1.57	.47914	1.575	.536046
.322	.50163	1.645	.017002	1.57	.47918	1.575	.536048
.323	.50167	1.645	.017004	1.57	.47921	1.575	.536051
.324	.50172	1.645	.017007	1.57	.47925	1.575	.536054
0.325	9.50490	1.645	0.017015	1.57	9.47969	1.575	0.536065
.326	.50493	1.645	.017017	1.57	.47973	1.575	.536068
.327	.50496	1.645	.017019	1.57	.47976	1.575	.536071
.328	.50499	1.645	.017021	1.57	.47979	1.575	.536074
.329	.50500	1.645	.017023	1.57	.47981	1.575	.536076
0.330	9.50807	1.645	0.017024	1.57	9.47993	1.575	0.536083
.331	.50811	1.645	.017027	1.57	.47997	1.575	.536086
.332	.50814	1.645	.017029	1.57	.47999	1.575	.536088
.333	.50817	1.645	.017031	1.57	.48001	1.575	.536091
.334	.50820	1.645	.017033	1.57	.48003	1.575	.536093
0.335	9.51114	1.645	0.017035	1.57	9.48015	1.575	0.536099
.336	.51118	1.645	.017037	1.57	.48019	1.575	.536102
.337	.51121	1.645	.017039	1.57	.48021	1.575	.536104
.338	.51124	1.645	.017041	1.57	.48023	1.575	.536106
.339	.51126	1.645	.017043	1.57	.48025	1.575	.536108
0.340	9.51431	1.645	0.017045	1.57	9.48037	1.575	0.536113
.341	.51434	1.645	.017047	1.57	.48040	1.575	.536116
.342	.51436	1.645	.017049	1.57	.48042	1.575	.536118
.343	.51438	1.645	.017051	1.57	.48044	1.575	.536120
.344	.51440	1.645	.017053	1.57	.48046	1.575	.536122
0.345	9.51749	1.645	0.017055	1.57	9.48059	1.575	0.536127
.346	.51751	1.645	.017057	1.57	.48062	1.575	.536130
.347	.51753	1.645	.017059	1.57	.48064	1.575	.536132
.348	.51755	1.645	.017061	1.57	.48066	1.575	.536134
.349	.51757	1.645	.017063	1.57	.48068	1.575	.536136
0.350	9.52060	1.645	0.017065	1.57	9.48082	1.575	0.536141
u	$\log \sinh u$	$u \text{ } ^\circ$	$\log \cosh u$	$u \text{ } ^\circ$	$\log \tanh u$	$u \text{ } ^\circ$	$\log \coth u$

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
0.350	9.55300	123.1	0.02609	14.6	9.54682	114.5	0.47318
.351	.55319	123.8	.02622	14.6	.54707	114.1	.47303
.352	.55347	124.1	.02637	14.7	.54731	113.7	.47289
.353	.55376	124.1	.02651	14.7	.54754	113.4	.47275
.354	.55401	124.8	.02666	14.8	.54777	113.0	.47263
0.355	9.55931	127.1	0.02681	14.8	9.55250	112.6	0.46750
.359	.55959	127.1	.02696	14.8	.55273	112.3	.46737
.359	.55983	126.8	.02711	14.9	.55297	111.9	.46725
.358	.55912	126.5	.02725	14.9	.55320	111.5	.46714
.359	.55938	126.1	.02740	15.0	.55343	111.2	.46702
0.360	9.56951	125.8	0.02755	15.0	9.55809	110.8	0.46191
.361	.56000	125.5	.02770	15.0	.55831	110.5	.46181
.360	.56015	125.2	.02786	15.1	.55853	110.1	.46170
.363	.56040	124.8	.02801	15.1	.55876	109.7	.46160
.364	.56065	124.5	.02816	15.1	.55899	109.4	.46151
0.365	9.57189	124.2	0.02831	15.2	9.56358	109.0	0.45642
.366	.57211	124.0	.02846	15.2	.56380	108.7	.45633
.367	.57237	124.0	.02861	15.3	.56402	108.3	.45624
.368	.57261	124.3	.02877	15.3	.56424	108.0	.45616
.369	.57284	123.0	.02892	15.3	.56446	107.7	.45608
0.370	9.57807	122.7	0.02907	15.4	9.56800	107.3	0.45101
.371	.57830	122.4	.02921	15.4	.56822	107.0	.45094
.372	.57851	122.1	.02936	15.4	.56843	106.6	.45087
.373	.57873	121.8	.02951	15.5	.56865	106.3	.45080
.374	.57895	121.5	.02966	15.5	.56886	106.0	.45074
0.375	9.58116	121.2	0.02981	15.6	9.56312	105.6	0.44568
.376	.58137	120.9	.02996	15.6	.56333	105.3	.44563
.377	.58159	120.6	.03011	15.6	.56354	105.0	.44558
.378	.58180	120.3	.03027	15.7	.56375	104.6	.44553
.379	.58200	120.0	.03042	15.7	.56396	104.3	.44548
0.380	9.59019	119.7	0.03057	15.8	9.55990	104.0	0.44044
.381	.59038	119.5	.03071	15.8	.56010	103.7	.44041
.382	.59057	119.2	.03085	15.8	.56031	103.3	.44037
.383	.59077	118.9	.03100	15.9	.56051	103.0	.44034
.384	.59095	118.6	.03115	15.9	.56070	102.7	.44031
0.385	9.59614	118.3	0.03132	15.9	9.56472	102.4	0.43528
.386	.59632	118.0	.03148	16.0	.56493	102.1	.43526
.387	.59650	117.8	.03164	16.0	.56513	101.8	.43524
.388	.59667	117.5	.03180	16.1	.56533	101.4	.43523
.389	.59685	117.2	.03196	16.1	.56553	101.1	.43521
0.390	9.60202	116.9	0.03212	16.1	9.56980	100.8	0.43020
.391	.60219	116.7	.03228	16.2	.56999	100.5	.43020
.392	.60235	116.4	.03245	16.2	.57018	100.2	.43019
.393	.60251	116.1	.03261	16.2	.57037	99.9	.43019
.394	.60268	115.9	.03277	16.3	.57056	99.6	.43020
0.395	9.60783	115.6	0.03293	16.3	9.57480	99.3	0.42520
.396	.60800	115.3	.03310	16.4	.57500	99.0	.42521
.397	.60814	115.1	.03326	16.4	.57519	98.7	.42522
.398	.60829	114.8	.03343	16.4	.57538	98.4	.42524
.399	.60844	114.6	.03359	16.5	.57557	98.1	.42525
0.400	9.61358	114.3	0.03375	16.5	9.57993	97.8	0.42027
u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
0.400	0.61358	114.3	0.63385	16.5	9.57573	97.8	0.42027
.401	.61472	114.0	.63404	16.5	.58070	97.5	.41030
.402	.61586	113.8	.63419	16.6	.58168	97.2	.40032
.403	.61700	113.5	.63435	16.6	.58265	96.9	.41735
.404	.61813	113.3	.63452	16.6	.58361	96.6	.40130
0.405	0.61926	113.0	0.63468	16.7	9.58458	96.3	0.41542
.406	.62039	112.8	.63485	16.7	.58554	96.1	.40445
.407	.62152	112.5	.63502	16.8	.58650	95.8	.41350
.408	.62264	112.3	.63519	16.8	.58746	95.5	.40254
.409	.62376	112.0	.63535	16.8	.58841	95.2	.41159
0.410	0.62488	111.8	0.63552	16.9	9.58936	94.9	0.41064
.411	.62600	111.6	.63569	16.9	.59031	94.6	.40969
.412	.62711	111.3	.63586	16.9	.59125	94.4	.40875
.413	.62823	111.1	.63603	17.0	.59220	94.1	.40780
.414	.62934	110.8	.63620	17.0	.59314	93.8	.40686
0.415	0.63044	110.6	0.63637	17.1	9.59407	93.5	0.40593
.416	.63155	110.4	.63654	17.1	.59501	93.3	.40499
.417	.63265	110.1	.63671	17.1	.59594	93.0	.40406
.418	.63375	109.9	.63688	17.2	.59687	92.7	.40313
.419	.63485	109.6	.63706	17.2	.59779	92.4	.40221
0.420	0.63594	109.4	0.63723	17.2	9.59871	92.2	0.40129
.421	.63704	109.2	.63740	17.3	.59963	91.9	.40037
.422	.63813	109.0	.63757	17.3	.60055	91.6	.39945
.423	.63922	108.7	.63775	17.3	.60147	91.4	.39853
.424	.64030	108.5	.63792	17.4	.60238	91.1	.39762
0.425	0.64139	108.3	0.63810	17.4	9.60330	90.8	0.39671
.426	.64247	108.0	.63827	17.5	.60420	90.6	.39580
.427	.64355	107.8	.63844	17.5	.60510	90.3	.39489
.428	.64462	107.6	.63862	17.5	.60600	90.1	.39398
.429	.64570	107.4	.63880	17.6	.60690	89.8	.39308
0.430	0.64677	107.1	0.63897	17.6	9.60780	89.6	0.39218
.431	.64784	106.9	.63915	17.6	.60869	89.3	.39128
.432	.64891	106.7	.63932	17.7	.60959	89.0	.39038
.433	.64997	106.5	.63950	17.7	.61047	88.8	.38948
.434	.65104	106.3	.63968	17.7	.61135	88.5	.38858
0.435	0.65210	106.0	0.63986	17.8	9.61224	88.3	0.38768
.436	.65316	105.8	.64003	17.8	.61313	88.0	.38678
.437	.65422	105.6	.64021	17.9	.61401	87.8	.38588
.438	.65527	105.4	.64039	17.9	.61488	87.5	.38498
.439	.65633	105.2	.64057	17.9	.61576	87.3	.38408
0.440	0.65738	105.0	0.64075	18.0	9.61663	87.0	0.38318
.441	.65843	104.8	.64093	18.0	.61750	86.8	.38228
.442	.65947	104.6	.64111	18.0	.61836	86.5	.38138
.443	.66052	104.4	.64129	18.1	.61923	86.3	.38048
.444	.66156	104.2	.64147	18.1	.62009	86.1	.37958
0.445	0.66260	104.0	0.64165	18.1	9.62095	85.8	0.37868
.446	.66364	103.7	.64183	18.2	.62180	85.6	.37778
.447	.66468	103.5	.64202	18.2	.62266	85.3	.37688
.448	.66572	103.3	.64220	18.3	.62351	85.1	.37598
.449	.66674	103.1	.64238	18.3	.62436	84.9	.37508
0.450	0.66777	102.9	0.64256	18.3	9.62521	84.6	0.37419
u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

u	log sinh u	= F'	log cosh u	= F'	log tanh u	= F'	log coth u
0.500	9.71622	94.0	0.05217	20.1	9.66475	73.9	0.33525
.501	.71786	93.8	.05237	20.1	.66540	73.7	.33451
.502	.71959	93.7	.05257	20.1	.66605	73.5	.33377
.503	.72123	93.5	.05277	20.2	.66670	73.3	.33304
.504	.72286	93.3	.05297	20.2	.66735	73.1	.33231
0.505	9.72450	93.2	0.05317	20.2	9.66842	72.9	0.33158
.506	.72613	93.0	.05336	20.3	.66915	72.8	.33085
.507	.72776	92.9	.05356	20.3	.66980	72.6	.33012
.508	.72940	92.7	.05376	20.3	.67045	72.4	.32939
.509	.73103	92.6	.05395	20.4	.67113	72.2	.32867
0.510	9.73264	92.4	0.05419	20.4	9.67205	72.0	0.32795
.511	.73426	92.3	.05439	20.4	.67277	71.8	.32723
.512	.73588	92.1	.05460	20.5	.67348	71.6	.32652
.513	.73750	92.0	.05480	20.5	.67420	71.5	.32580
.514	.73912	91.8	.05501	20.5	.67491	71.3	.32509
0.515	9.74074	91.7	0.05521	20.6	9.67562	71.1	0.32438
.516	.74235	91.5	.05542	20.6	.67633	70.9	.32367
.517	.74397	91.4	.05563	20.6	.67704	70.7	.32296
.518	.74558	91.2	.05583	20.7	.67775	70.5	.32225
.519	.74720	91.1	.05604	20.7	.67845	70.3	.32155
0.520	9.74882	90.9	0.05625	20.7	9.67916	70.2	0.32084
.521	.74943	90.8	.05645	20.8	.67986	70.0	.32014
.522	.75104	90.6	.05666	20.8	.68055	69.8	.31944
.523	.75265	90.5	.05687	20.8	.68125	69.6	.31875
.524	.75426	90.3	.05708	20.9	.68195	69.5	.31805
0.525	9.75584	90.2	0.05729	20.9	9.68266	69.3	0.31736
.526	.75645	90.0	.05750	20.9	.68333	69.1	.31667
.527	.75806	89.9	.05771	21.0	.68402	68.9	.31598
.528	.75967	89.8	.05792	21.0	.68471	68.7	.31529
.529	.76128	89.6	.05813	21.0	.68540	68.6	.31460
0.530	9.76230	89.5	0.05834	21.1	9.68608	68.4	0.31392
.531	.76391	89.3	.05855	21.1	.68677	68.2	.31323
.532	.76552	89.2	.05876	21.1	.68745	68.0	.31255
.533	.76713	89.1	.05897	21.2	.68813	67.9	.31187
.534	.76874	88.9	.05918	21.2	.68880	67.7	.31120
0.535	9.76986	88.8	0.05939	21.2	9.68948	67.5	0.31052
.536	.77147	88.6	.05960	21.3	.69016	67.4	.30984
.537	.77308	88.5	.05982	21.3	.69083	67.2	.30917
.538	.77469	88.4	.06003	21.3	.69150	67.0	.30850
.539	.77630	88.2	.06024	21.4	.69217	66.9	.30783
0.540	9.77742	88.1	0.06045	21.4	9.69284	66.7	0.30716
.541	.77903	88.0	.06066	21.4	.69350	66.5	.30650
.542	.78064	87.8	.06087	21.5	.69417	66.3	.30583
.543	.78225	87.7	.06111	21.5	.69483	66.2	.30517
.544	.78386	87.6	.06132	21.5	.69549	66.0	.30451
0.545	9.78498	87.4	0.06154	21.6	9.69615	65.9	0.30385
.546	.78659	87.3	.06175	21.6	.69681	65.7	.30319
.547	.78820	87.2	.06197	21.6	.69746	65.5	.30254
.548	.78981	87.0	.06219	21.7	.69812	65.4	.30188
.549	.79142	86.9	.06240	21.7	.69877	65.2	.30123
0.550	9.79254	86.8	0.06262	21.7	9.69942	65.0	0.30058
u	log tan u	= F'	log sec u	= F'	log sin u	= F'	log cos u

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

u	log sinh u	= F ₁ '	log cosh u	= F ₂ '	log tanh u	= F ₃ '	log coth u
0.550	9.76604	85.8	0.06262	21.7	9.69912	65.0	0.30688
.551	.76621	85.6	.06281	21.8	.70007	64.0	.29983
.552	.76637	85.5	.06306	21.8	.70072	64.7	.29328
.553	.76654	85.4	.06327	21.8	.70137	64.5	.28653
.554	.76670	85.3	.06349	21.9	.70201	64.4	.27959
0.555	9.76686	85.1	0.06371	21.9	9.70265	64.2	0.27275
.556	.76692	85.0	.06393	21.9	.70329	64.1	.26571
.557	.76708	84.9	.06415	22.0	.70393	63.9	.25867
.558	.76724	84.7	.06437	22.0	.70457	63.7	.25153
.559	.76740	84.6	.06459	22.0	.70521	63.6	.24479
0.560	9.76766	84.5	0.06481	22.1	9.70584	63.4	0.23765
.561	.76781	84.4	.06503	22.1	.70648	63.3	.23052
.562	.76797	84.2	.06525	22.1	.70711	63.1	.22339
.563	.76813	84.1	.06547	22.2	.70774	63.0	.21626
.564	.76829	84.0	.06569	22.2	.70837	62.8	.20913
0.565	9.76851	83.9	0.06592	22.2	9.70900	62.7	0.20199
.566	.76867	83.8	.06614	22.3	.70962	62.5	.19486
.567	.76883	83.6	.06636	22.3	.71025	62.3	.18773
.568	.76899	83.5	.06659	22.3	.71087	62.2	.18060
.569	.76915	83.4	.06681	22.3	.71149	62.0	.17347
0.570	9.76951	83.3	0.06703	22.4	9.71211	61.9	0.16633
.571	.76967	83.2	.06725	22.4	.71273	61.7	.15920
.572	.76983	83.0	.06748	22.4	.71334	61.6	.15206
.573	.76999	82.9	.06771	22.5	.71395	61.4	.14493
.574	.77015	82.8	.06793	22.5	.71457	61.3	.13780
0.575	9.77031	82.7	0.06816	22.5	9.71519	61.1	0.13067
.576	.77047	82.6	.06838	22.6	.71580	61.0	.12354
.577	.77063	82.4	.06861	22.6	.71641	60.8	.11641
.578	.77079	82.3	.06883	22.6	.71701	60.7	.10928
.579	.77095	82.2	.06905	22.7	.71762	60.5	.10215
0.580	9.77111	82.1	0.06927	22.7	9.71822	60.4	0.09502
.581	.77127	82.0	.06951	22.7	.71883	60.2	.08789
.582	.77143	81.9	.06974	22.8	.71943	60.1	.08076
.583	.77159	81.7	.06997	22.8	.72003	60.0	.07363
.584	.77175	81.6	.07020	22.8	.72063	59.8	.06650
0.585	9.77191	81.5	0.07043	22.9	9.72123	59.7	0.05937
.586	.77207	81.4	.07065	22.9	.72182	59.5	.05224
.587	.77223	81.3	.07088	22.9	.72242	59.4	.04511
.588	.77239	81.2	.07111	23.0	.72301	59.2	.03798
.589	.77255	81.1	.07134	23.0	.72360	59.1	.03085
0.590	9.77271	81.0	0.07157	23.0	9.72419	59.0	0.02372
.591	.77287	80.8	.07180	23.0	.72478	58.8	.01659
.592	.77303	80.7	.07203	23.1	.72537	58.7	.00946
.593	.77319	80.6	.07226	23.1	.72596	58.5	.00233
.594	.77335	80.5	.07249	23.1	.72654	58.4	.00000
0.595	9.77351	80.4	0.07271	23.2	9.72712	58.2	0.00000
.596	.77367	80.3	.07295	23.2	.72770	58.1	.00000
.597	.77383	80.2	.07319	23.2	.72828	58.0	.00000
.598	.77399	80.1	.07342	23.3	.72886	57.8	.00000
.599	.77415	80.0	.07365	23.3	.72944	57.7	.00000
0.600	9.77431	80.0	0.07389	23.3	9.73001	57.5	0.00000
u	log tan gd u	= F ₄ '	log sec gd u	= F ₅ '	log sin gd u	= F ₆ '	log cot gd u

Logarithms of Hyperbolic Functions.

u	log sinh u	= F/	log cosh u	= F/	log tanh u	= F/	log coth u
0.600	0.80300	80.0	0.07389	23.3	0.73001	57.5	0.26009
.601	.80371	80.8	.07412	23.4	.73089	57.4	.26011
.602	.80452	80.7	.07436	23.4	.73110	57.3	.26011
.603	.80532	80.5	.07459	23.4	.73173	57.1	.26017
.604	.80713	80.4	.07483	23.4	.73231	57.0	.26070
0.605	0.80703	80.3	0.07506	23.5	0.73287	56.9	0.26173
.606	.80874	80.2	.07520	23.5	.73344	56.7	.26080
.607	.80954	80.1	.07533	23.5	.73401	56.6	.26090
.608	.81031	80.0	.07556	23.6	.73457	56.5	.26043
.609	.81114	79.9	.07600	23.6	.73514	56.3	.26086
0.610	0.81194	79.8	0.07624	23.6	0.73570	56.2	0.26130
.611	.81273	79.7	.07647	23.7	.73626	56.0	.26074
.612	.81353	79.6	.07671	23.7	.73682	55.9	.26018
.613	.81433	79.5	.07695	23.7	.73738	55.8	.26062
.614	.81512	79.4	.07718	23.8	.73794	55.7	.26066
0.615	0.81591	79.3	0.07742	23.8	0.73850	55.5	0.26151
.616	.81671	79.2	.07765	23.8	.73905	55.4	.26095
.617	.81750	79.1	.07790	23.8	.73960	55.3	.26140
.618	.81829	79.0	.07814	23.9	.74015	55.1	.26083
.619	.81908	78.9	.07838	23.9	.74070	55.0	.26130
0.620	0.81987	78.8	0.07861	23.9	0.74125	54.9	0.26075
.621	.82065	78.7	.07885	24.0	.74180	54.7	.26019
.622	.82144	78.6	.07909	24.0	.74235	54.6	.26063
.623	.82223	78.5	.07933	24.0	.74289	54.5	.26017
.624	.82301	78.4	.07957	24.1	.74344	54.3	.26060
0.625	0.82380	78.3	0.07980	24.1	0.74398	54.2	0.26102
.626	.82458	78.2	.08005	24.1	.74452	54.1	.26046
.627	.82536	78.1	.08030	24.1	.74506	54.0	.26090
.628	.82614	78.0	.08054	24.2	.74560	53.8	.26033
.629	.82692	77.9	.08078	24.2	.74614	53.7	.26076
0.630	0.82770	77.8	0.08102	24.2	0.74667	53.6	0.26118
.631	.82848	77.7	.08126	24.3	.74721	53.5	.26062
.632	.82925	77.6	.08151	24.3	.74774	53.3	.26015
.633	.83003	77.5	.08175	24.3	.74828	53.2	.26058
.634	.83080	77.4	.08200	24.4	.74881	53.1	.26010
0.635	0.83158	77.3	0.08224	24.4	0.74934	53.0	0.26052
.636	.83235	77.2	.08248	24.4	.74987	52.8	.26013
.637	.83312	77.1	.08273	24.4	.75040	52.7	.26056
.638	.83389	77.0	.08297	24.5	.75093	52.6	.26010
.639	.83466	77.0	.08322	24.5	.75145	52.5	.26053
0.640	0.83543	76.9	0.08346	24.5	0.75197	52.3	0.26095
.641	.83620	76.8	.08371	24.6	.75250	52.2	.26038
.642	.83697	76.7	.08395	24.6	.75302	52.1	.26081
.643	.83774	76.6	.08420	24.6	.75354	52.0	.26024
.644	.83850	76.5	.08445	24.7	.75406	51.9	.26067
0.645	0.83927	76.4	0.08469	24.7	0.75457	51.7	0.26108
.646	.84003	76.3	.08494	24.7	.75509	51.6	.26051
.647	.84079	76.2	.08519	24.7	.75561	51.5	.26094
.648	.84155	76.1	.08543	24.8	.75612	51.4	.26037
.649	.84231	76.1	.08568	24.8	.75663	51.3	.26080
0.650	0.84308	76.0	0.08593	24.8	0.75715	51.1	0.26121
x	log tan gd u	= F/	log sec gd u	= F/	log sin gd u	= F/	log cos gd u

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
0.050	9.84388	76.0	0.08993	24.0	9.75715	51.1	0.24085
.051	8.43881	75.9	.08998	24.0	.75710	51.0	.24124
.052	8.4459	75.8	.08993	24.0	.75707	50.9	.24163
.053	8.4515	75.7	.08988	24.0	.75707	50.8	.24183
.054	8.4611	75.6	.08993	24.0	.75708	50.7	.24204
0.055	9.84689	75.5	0.08998	25.0	9.75699	50.6	0.24231
.056	8.47652	75.4	.08993	25.0	.75699	50.5	.24261
.057	8.4837	75.4	.08988	25.0	.75699	50.4	.24290
.058	8.4912	75.3	.08993	25.1	.75699	50.3	.24319
.059	8.4988	75.2	.08988	25.1	.75699	50.1	.24349
0.060	9.85163	75.1	0.08993	25.1	9.75688	50.0	0.24379
.061	8.5138	75.0	.08988	25.1	.75688	49.9	.24409
.062	8.5213	74.9	.08993	25.2	.75688	49.7	.24439
.063	8.5288	74.8	.08988	25.2	.75688	49.6	.24469
.064	8.5362	74.7	.08993	25.2	.75688	49.5	.24499
0.065	9.85637	74.6	0.08998	25.2	9.75679	49.4	0.24529
.066	8.5512	74.5	.08993	25.3	.75679	49.3	.24559
.067	8.5586	74.5	.08988	25.3	.75679	49.2	.24589
.068	8.5661	74.4	.08993	25.3	.75679	49.1	.24619
.069	8.5735	74.3	.08988	25.4	.75679	49.0	.24649
0.070	9.86109	74.2	0.08998	25.4	9.75670	48.8	0.24679
.071	8.5984	74.1	.08993	25.4	.75670	48.7	.24709
.072	8.6058	74.1	.08988	25.5	.75670	48.6	.24739
.073	8.6132	74.0	.08993	25.5	.75670	48.5	.24769
.074	8.6206	73.9	.08988	25.5	.75670	48.4	.24799
0.075	9.86580	73.8	0.08998	25.5	9.75661	48.3	0.24829
.076	8.6253	73.7	.08993	25.6	.75661	48.2	.24859
.077	8.6327	73.7	.08988	25.6	.75661	48.1	.24889
.078	8.6401	73.6	.08993	25.6	.75661	47.9	.24919
.079	8.6475	73.5	.08988	25.7	.75661	47.8	.24949
0.080	9.87038	73.4	0.08998	25.7	9.75652	47.7	0.24979
.081	8.6621	73.3	.08993	25.7	.75652	47.6	.25009
.082	8.6695	73.3	.08988	25.7	.75652	47.5	.25039
.083	8.6769	73.2	.08993	25.8	.75652	47.4	.25069
.084	8.6843	73.1	.08988	25.8	.75652	47.3	.25099
0.085	9.87504	73.0	0.08998	25.8	9.75643	47.2	0.25129
.086	8.6987	72.9	.08993	25.9	.75643	47.1	.25159
.087	8.7061	72.9	.08988	25.9	.75643	47.0	.25189
.088	8.7135	72.8	.08993	25.9	.75643	46.9	.25219
.089	8.7209	72.7	.08988	25.9	.75643	46.8	.25249
0.090	9.87978	72.6	0.08998	26.0	9.75634	46.7	0.25279
.091	8.7351	72.5	.08993	26.0	.75634	46.6	.25309
.092	8.7425	72.5	.08988	26.0	.75634	46.5	.25339
.093	8.7499	72.4	.08993	26.1	.75634	46.4	.25369
.094	8.7573	72.3	.08988	26.1	.75634	46.3	.25399
0.095	9.88450	72.2	0.08998	26.1	9.75625	46.1	0.25429
.096	8.7712	72.2	.08993	26.1	.75625	46.0	.25459
.097	8.7786	72.1	.08988	26.2	.75625	45.9	.25489
.098	8.7860	72.0	.08993	26.2	.75625	45.8	.25519
.099	8.7934	71.9	.08988	26.2	.75625	45.7	.25549
0.100	9.88900	71.8	0.08998	26.2	9.75616	45.6	0.25579
u	$\log \tanh u$	$= F_1'$	$\log \coth u$	$= F_2'$	$\log \sinh u$	$= F_3'$	$\log \cosh u$

Logarithms of Hyperbolic Functions.

u	log sinh u	= F'	log cosh u	= F'	log tanh u	= F'	log coth u
0.700	0.88000	71.0	0.00870	26.2	0.78130	45.6	0.21870
.701	.88092	71.8	.00891	26.3	.78176	45.5	.21841
.702	.88144	71.7	.00923	26.3	.78221	45.4	.21779
.703	.88205	71.6	.00940	26.3	.78266	45.3	.21721
.704	.88287	71.6	.00975	26.4	.78312	45.2	.21688
0.705	0.88330	71.5	0.10008	26.4	0.78357	45.1	0.21643
.706	.88430	71.4	.10028	26.4	.78402	45.0	.21598
.707	.88509	71.3	.10055	26.4	.78447	44.9	.21553
.708	.88573	71.3	.10081	26.5	.78492	44.8	.21508
.709	.88644	71.2	.10108	26.5	.78536	44.7	.21464
0.710	0.88715	71.1	0.10134	26.5	0.78581	44.6	0.21419
.711	.88786	71.0	.10161	26.5	.78626	44.5	.21374
.712	.88857	71.0	.10187	26.6	.78670	44.4	.21330
.713	.88928	70.9	.10214	26.6	.78714	44.3	.21286
.714	.88999	70.8	.10240	26.6	.78759	44.2	.21241
0.715	0.89070	70.8	0.10267	26.7	0.78803	44.1	0.21197
.716	.89141	70.7	.10294	26.7	.78847	44.0	.21152
.717	.89211	70.6	.10320	26.7	.78891	43.9	.21108
.718	.89282	70.5	.10347	26.7	.78935	43.8	.21065
.719	.89352	70.5	.10374	26.8	.78978	43.7	.21022
0.720	0.89423	70.4	0.10401	26.8	0.79022	43.6	0.20978
.721	.89493	70.3	.10427	26.8	.79066	43.5	.20934
.722	.89563	70.3	.10454	26.8	.79109	43.4	.20891
.723	.89634	70.2	.10481	26.9	.79153	43.3	.20847
.724	.89704	70.1	.10508	26.9	.79196	43.2	.20804
0.725	0.89774	70.0	0.10535	26.9	0.79239	43.1	0.20761
.726	.89844	70.0	.10562	27.0	.79282	43.0	.20718
.727	.89914	69.9	.10589	27.0	.79325	42.9	.20675
.728	.89984	69.8	.10616	27.0	.79368	42.8	.20632
.729	.90054	69.8	.10643	27.0	.79411	42.7	.20589
0.730	0.90123	69.7	0.10670	27.1	0.79453	42.6	0.20547
.731	.90193	69.6	.10697	27.1	.79496	42.5	.20504
.732	.90263	69.6	.10724	27.1	.79538	42.4	.20462
.733	.90332	69.5	.10751	27.1	.79581	42.4	.20419
.734	.90402	69.4	.10778	27.2	.79623	42.3	.20377
0.735	0.90471	69.4	0.10805	27.2	0.79665	42.2	0.20335
.736	.90540	69.3	.10833	27.2	.79708	42.1	.20292
.737	.90610	69.2	.10860	27.2	.79750	42.0	.20250
.738	.90679	69.2	.10887	27.3	.79792	41.9	.20208
.739	.90748	69.1	.10915	27.3	.79833	41.8	.20167
0.740	0.90817	69.0	0.10942	27.3	0.79875	41.7	0.20125
.741	.90886	69.0	.10969	27.3	.79917	41.6	.20083
.742	.90955	68.9	.10997	27.4	.79958	41.5	.20042
.743	.91024	68.8	.11024	27.4	.80000	41.4	.20000
.744	.91093	68.8	.11051	27.4	.80041	41.3	.19959
0.745	0.91161	68.7	0.11079	27.5	0.80082	41.2	0.19918
.746	.91230	68.6	.11106	27.5	.80124	41.2	.19876
.747	.91298	68.6	.11134	27.5	.80165	41.1	.19835
.748	.91367	68.5	.11161	27.5	.80206	41.0	.19794
.749	.91435	68.4	.11189	27.6	.80247	40.9	.19753
0.750	0.91504	68.4	0.11216	27.6	0.80288	40.8	0.19712
u	log tanh u	= F'	log coth u	= F'	log sin u	= F'	log cos u

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Logarithms of Hyperbolic Functions.

u	log sinh u	w F'	log cosh u	w F'	log tanh u	w F'	log coth u
0.750	0.01504	68.4	0.11216	27.6	0.80288	40.8	0.19712
.751	.01512	68.3	.11244	27.6	.80328	40.7	.19672
.752	.01521	68.2	.11272	27.6	.80369	40.6	.19631
.753	.01529	68.2	.11300	27.7	.80410	40.5	.19590
.754	.01537	68.1	.11327	27.7	.80450	40.4	.19550
0.755	0.01545	68.1	0.11355	27.7	0.80490	40.3	0.19510
.756	.01553	68.0	.11382	27.7	.80531	40.3	.19469
.757	.01561	67.9	.11410	27.8	.80571	40.2	.19429
.758	.01569	67.9	.11438	27.8	.80611	40.1	.19389
.759	.01577	67.8	.11466	27.8	.80651	40.0	.19349
0.760	0.01585	67.7	0.11493	27.8	0.80691	39.9	0.19309
.761	.01593	67.7	.11521	27.9	.80731	39.8	.19269
.762	.01601	67.6	.11549	27.9	.80771	39.7	.19229
.763	.01609	67.6	.11577	27.9	.80810	39.6	.19189
.764	.01617	67.5	.11605	27.9	.80850	39.5	.19149
0.765	0.01625	67.4	0.11633	28.0	0.80890	39.5	0.19111
.766	.01633	67.4	.11661	28.0	.80930	39.4	.19071
.767	.01641	67.3	.11689	28.0	.80968	39.3	.19031
.768	.01649	67.3	.11717	28.0	.81007	39.2	.18991
.769	.01657	67.2	.11745	28.1	.81047	39.1	.18951
0.770	0.01665	67.1	0.11773	28.1	0.81086	39.0	0.18914
.771	.01673	67.1	.11801	28.1	.81125	38.9	.18873
.772	.01681	67.0	.11829	28.1	.81164	38.9	.18833
.773	.01689	67.0	.11857	28.2	.81204	38.8	.18793
.774	.01697	66.9	.11886	28.2	.81244	38.7	.18753
0.775	0.01705	66.8	0.11914	28.2	0.81283	38.6	0.18713
.776	.01713	66.8	.11942	28.3	.81323	38.5	.18672
.777	.01721	66.7	.11970	28.3	.81362	38.4	.18632
.778	.01729	66.7	.11998	28.3	.81402	38.4	.18592
.779	.01737	66.6	.12027	28.3	.81441	38.3	.18552
0.780	0.01745	66.5	0.12055	28.3	0.81481	38.2	0.18512
.781	.01753	66.5	.12083	28.4	.81520	38.1	.18472
.782	.01761	66.4	.12112	28.4	.81559	38.0	.18432
.783	.01769	66.4	.12141	28.4	.81598	37.9	.18392
.784	.01777	66.3	.12169	28.4	.81638	37.9	.18352
0.785	0.01785	66.2	0.12197	28.5	0.81677	37.8	0.18312
.786	.01793	66.2	.12226	28.5	.81716	37.7	.18272
.787	.01801	66.1	.12254	28.5	.81755	37.6	.18232
.788	.01809	66.1	.12283	28.5	.81794	37.5	.18192
.789	.01817	66.0	.12312	28.6	.81833	37.4	.18152
0.790	0.01825	66.0	0.12340	28.6	0.81872	37.4	0.18112
.791	.01833	65.9	.12369	28.6	.81911	37.3	.18072
.792	.01841	65.8	.12397	28.6	.81950	37.2	.18032
.793	.01849	65.8	.12426	28.7	.81989	37.1	.17992
.794	.01857	65.7	.12455	28.7	.82028	37.0	.17952
0.795	0.01865	65.7	0.12483	28.7	0.82067	37.0	0.17912
.796	.01873	65.6	.12512	28.7	.82106	36.9	.17872
.797	.01881	65.6	.12541	28.8	.82145	36.8	.17832
.798	.01889	65.5	.12570	28.8	.82184	36.7	.17792
.799	.01897	65.5	.12599	28.8	.82223	36.6	.17752
0.800	0.01905	65.4	0.12627	28.8	0.82262	36.6	0.17712
u	log tan gd u	w F'	log sec gd u	w F'	log ale gd u	w F'	log coe gd u

Logarithms of Hyperbolic Functions.

x	$\log \sinh x$	$= F_1'$	$\log \cosh x$	$= F_2'$	$\log \tanh x$	$= F_3'$	$\log \coth x$
0.350	0.680561	62.8	0.42999	30.0	0.250572	12.8	0.74048
0.351	0.68114	62.8	0.43129	30.0	0.25185	12.8	0.74165
0.352	0.68172	62.7	0.43259	30.1	0.25318	12.7	0.74281
0.353	0.68230	62.7	0.43389	30.1	0.25450	12.6	0.74398
0.354	0.68288	62.7	0.43519	30.1	0.25583	12.6	0.74517
0.355	0.68345	62.6	0.43649	30.1	0.25715	12.5	0.74635
0.356	0.68403	62.6	0.43779	30.1	0.25848	12.4	0.74752
0.357	0.68460	62.5	0.43909	30.2	0.25980	12.3	0.74870
0.358	0.68518	62.5	0.44039	30.2	0.26113	12.3	0.74987
0.359	0.68575	62.4	0.44169	30.2	0.26245	12.2	0.75105
0.360	0.68633	62.4	0.44299	30.2	0.26377	12.1	0.75223
0.361	0.68691	62.3	0.44429	30.3	0.26510	12.1	0.75341
0.362	0.68748	62.3	0.44559	30.3	0.26642	12.0	0.75459
0.363	0.68806	62.2	0.44689	30.3	0.26775	11.9	0.75577
0.364	0.68864	62.2	0.44819	30.3	0.26907	11.9	0.75695
0.365	0.68921	62.1	0.44949	30.3	0.27040	11.8	0.75813
0.366	0.68979	62.1	0.45079	30.3	0.27172	11.7	0.75931
0.367	0.69037	62.1	0.45209	30.3	0.27305	11.7	0.76049
0.368	0.69094	62.0	0.45339	30.4	0.27437	11.6	0.76167
0.369	0.69152	62.0	0.45469	30.4	0.27570	11.5	0.76285
0.370	0.69209	61.9	0.45599	30.4	0.27702	11.5	0.76403
0.371	0.69267	61.9	0.45729	30.5	0.27835	11.4	0.76521
0.372	0.69325	61.8	0.45859	30.5	0.27967	11.3	0.76639
0.373	0.69382	61.8	0.45989	30.5	0.28100	11.3	0.76757
0.374	0.69440	61.7	0.46119	30.5	0.28232	11.2	0.76875
0.375	0.69498	61.7	0.46249	30.6	0.28365	11.1	0.76993
0.376	0.69555	61.7	0.46379	30.6	0.28497	11.1	0.77111
0.377	0.69613	61.6	0.46509	30.6	0.28630	11.0	0.77229
0.378	0.69671	61.6	0.46639	30.6	0.28762	10.9	0.77347
0.379	0.69728	61.5	0.46769	30.7	0.28895	10.9	0.77465
0.380	0.69786	61.5	0.46899	30.7	0.29027	10.8	0.77583
0.381	0.69844	61.4	0.47029	30.7	0.29160	10.7	0.77701
0.382	0.69901	61.4	0.47159	30.7	0.29292	10.7	0.77819
0.383	0.69959	61.3	0.47289	30.7	0.29425	10.6	0.77937
0.384	0.70017	61.3	0.47419	30.8	0.29557	10.5	0.78055
0.385	0.70074	61.2	0.47549	30.8	0.29690	10.5	0.78173
0.386	0.70132	61.2	0.47679	30.8	0.29822	10.4	0.78291
0.387	0.70190	61.2	0.47809	30.8	0.29955	10.3	0.78409
0.388	0.70248	61.1	0.47939	30.9	0.30087	10.3	0.78527
0.389	0.70306	61.1	0.48069	30.9	0.30220	10.2	0.78645
0.390	0.70364	61.0	0.48199	30.9	0.30352	10.2	0.78763
0.391	0.70421	61.0	0.48329	31.0	0.30485	10.1	0.78881
0.392	0.70479	61.0	0.48459	31.0	0.30617	10.0	0.79000
0.393	0.70537	60.9	0.48589	31.0	0.30750	9.9	0.79118
0.394	0.70594	60.9	0.48719	31.0	0.30882	9.9	0.79236
0.395	0.70652	60.8	0.48849	31.1	0.31015	9.8	0.79354
0.396	0.70710	60.8	0.48979	31.1	0.31147	9.8	0.79472
0.397	0.70768	60.8	0.49109	31.1	0.31280	9.7	0.79590
0.398	0.70826	60.7	0.49239	31.1	0.31412	9.6	0.79708
0.399	0.70884	60.7	0.49369	31.1	0.31545	9.6	0.79826
0.400	0.70942	60.6	0.49499	31.1	0.31677	9.5	0.79944
x	$\log \sinh x$	$= F_1'$	$\log \cosh x$	$= F_2'$	$\log \tanh x$	$= F_3'$	$\log \coth x$

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
0.000	0.00137	60.6	0.19557	31.4	0.35500	20.5	0.34498
.001	.00119	60.6	.19558	31.4	.35501	20.5	.34498
.002	.00129	60.5	.19559	31.4	.35502	20.5	.34497
.003	.00138	60.5	.19560	31.4	.35503	20.5	.34496
.004	.00149	60.5	.19561	31.4	.35504	20.5	.34495
0.005	0.00159	60.4	0.19563	31.4	0.35505	20.5	0.34494
.006	.00160	60.4	.19564	31.4	.35505	20.5	.34493
.007	.00169	60.4	.19565	31.4	.35506	20.5	.34492
.008	.00169	60.4	.19567	31.4	.35507	20.5	.34490
.009	.00169	60.4	.19568	31.4	.35507	20.5	.34487
0.010	0.00174	60.3	0.19569	31.4	0.35508	20.5	0.34489
.011	.00174	60.3	.19571	31.4	.35509	20.5	.34479
.012	.00175	60.3	.19570	31.4	.35509	20.5	.34484
.013	.00175	60.3	.19571	31.4	.35509	20.5	.34482
.014	.00175	60.3	.19575	31.4	.35512	20.5	.34481
0.015	0.00174	60.3	0.19576	31.4	0.35509	20.5	0.34485
.016	.00174	60.3	.19578	31.4	.35511	20.5	.34479
.017	.00174	60.3	.19579	31.4	.35511	20.5	.34478
.018	.00174	60.3	.19581	31.4	.35512	20.5	.34474
.019	.00174	60.3	.19582	31.4	.35512	20.5	.34471
0.020	0.00174	60.2	0.19584	31.4	0.35509	20.5	0.34472
.021	.00174	60.2	.19585	31.4	.35510	20.5	.34464
.022	.00174	60.2	.19587	31.4	.35511	20.5	.34460
.023	.00174	60.2	.19588	31.4	.35512	20.5	.34458
.024	.00174	60.2	.19589	31.4	.35512	20.5	.34456
0.025	0.00174	60.1	0.19591	31.4	0.35512	20.5	0.34472
.026	.00174	60.1	.19593	31.4	.35513	20.5	.34464
.027	.00174	60.1	.19595	31.4	.35514	20.5	.34460
.028	.00174	60.1	.19596	31.4	.35514	20.5	.34458
.029	.00174	60.1	.19598	31.4	.35515	20.5	.34454
0.030	0.00174	60.1	0.19599	31.4	0.35515	20.5	0.34454
.031	.00174	60.1	.19602	31.4	.35516	20.5	.34446
.032	.00174	60.1	.19604	31.4	.35517	20.5	.34442
.033	.00174	60.1	.19605	31.4	.35517	20.5	.34439
.034	.00174	60.1	.19607	31.4	.35518	20.5	.34434
0.035	0.00174	60.1	0.19609	31.4	0.35518	20.5	0.34445
.036	.00174	60.1	.19611	31.4	.35519	20.5	.34437
.037	.00174	60.1	.19612	31.4	.35519	20.5	.34434
.038	.00174	60.1	.19614	31.4	.35520	20.5	.34431
.039	.00174	60.1	.19615	31.4	.35520	20.5	.34428
0.040	0.00174	60.1	0.19616	31.4	0.35520	20.5	0.34435
.041	.00174	60.0	.19618	31.4	.35521	20.5	.34427
.042	.00174	60.0	.19620	31.4	.35522	20.5	.34423
.043	.00174	60.0	.19622	31.4	.35523	20.5	.34419
.044	.00174	60.0	.19623	31.4	.35523	20.5	.34417
0.045	0.00174	60.0	0.19624	31.4	0.35523	20.5	0.34423
.046	.00174	60.0	.19626	31.4	.35524	20.5	.34415
.047	.00174	60.0	.19627	31.4	.35524	20.5	.34412
.048	.00174	60.0	.19629	31.4	.35525	20.5	.34409
.049	.00174	60.0	.19630	31.4	.35525	20.5	.34406
0.050	0.00174	60.0	0.19631	31.4	0.35525	20.5	0.34406
u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$

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Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F'$	$\log \cosh u$	$= F'$	$\log \tanh u$	$= F'$	$\log \coth u$
0.020	0.01180	58.2	0.17581	34.1	9.89980	24.6	0.13096
0.030	0.01748	58.2	0.17581	34.1	9.89937	24.5	1.0003
0.040	0.02310	58.0	0.17581	34.2	9.89894	24.5	1.0017
0.050	0.02866	58.0	0.17581	34.3	9.89850	24.4	1.0030
0.060	0.03415	58.0	0.17581	34.3	9.89806	24.4	1.0044
0.070	0.03961	58.3	0.17589	34.3	9.89763	24.3	0.13057
0.080	0.04504	58.3	0.17589	34.2	9.89720	24.2	1.0031
0.090	0.05042	58.3	0.17589	34.3	9.89676	24.2	1.0045
0.100	0.05577	58.4	0.17589	34.3	9.89633	24.1	1.0059
0.110	0.06109	58.4	0.17589	34.3	9.89589	24.1	1.0073
0.120	0.06637	58.4	0.17581	34.3	9.89545	24.1	1.0087
0.130	0.07161	58.1	0.17581	34.3	9.89502	24.0	0.13027
0.140	0.07681	58.1	0.17581	34.4	9.89458	24.0	1.0091
0.150	0.08197	58.1	0.17581	34.4	9.89415	24.0	1.0105
0.160	0.08709	58.2	0.17581	34.4	9.89371	24.0	1.0119
0.170	0.09217	58.2	0.17581	34.4	9.89327	23.9	1.0133
0.180	0.09721	58.2	0.17581	34.4	9.89283	23.8	0.13007
0.190	0.10221	58.1	0.17581	34.4	9.89239	23.7	1.0137
0.200	0.10718	58.1	0.17581	34.5	9.89195	23.7	1.0151
0.210	0.11211	58.1	0.17581	34.5	9.89151	23.7	1.0165
0.220	0.11700	58.1	0.17581	34.5	9.89107	23.6	1.0179
0.230	0.12185	58.0	0.17581	34.5	9.89063	23.6	1.0193
0.240	0.12666	58.0	0.17581	34.5	9.89019	23.5	1.0207
0.250	0.13143	58.0	0.17581	34.5	9.88975	23.5	0.13007
0.260	0.13616	58.0	0.17581	34.5	9.88931	23.4	1.0211
0.270	0.14085	58.0	0.17581	34.5	9.88887	23.4	1.0225
0.280	0.14550	58.0	0.17581	34.5	9.88843	23.4	1.0239
0.290	0.15011	58.0	0.17581	34.5	9.88799	23.3	1.0253
0.300	0.15468	58.0	0.17581	34.5	9.88755	23.3	0.13007
0.310	0.15921	58.0	0.17581	34.5	9.88711	23.3	1.0267
0.320	0.16370	58.0	0.17581	34.5	9.88667	23.3	1.0281
0.330	0.16815	58.0	0.17581	34.5	9.88623	23.2	1.0295
0.340	0.17256	58.0	0.17581	34.5	9.88579	23.2	1.0309
0.350	0.17693	58.0	0.17581	34.5	9.88535	23.2	1.0323
0.360	0.18126	58.0	0.17581	34.5	9.88491	23.1	0.13007
0.370	0.18555	58.0	0.17581	34.5	9.88447	23.1	1.0337
0.380	0.18980	58.0	0.17581	34.5	9.88403	23.1	1.0351
0.390	0.19401	58.0	0.17581	34.5	9.88359	23.0	1.0365
0.400	0.19818	58.0	0.17581	34.5	9.88315	23.0	0.13007
0.410	0.20231	58.0	0.17581	34.5	9.88271	23.0	1.0379
0.420	0.20640	58.0	0.17581	34.5	9.88227	22.9	1.0393
0.430	0.21045	58.0	0.17581	34.5	9.88183	22.9	1.0407
0.440	0.21446	58.0	0.17581	34.5	9.88139	22.9	1.0421
0.450	0.21843	58.0	0.17581	34.5	9.88095	22.8	0.13007
0.460	0.22236	58.0	0.17581	34.5	9.88051	22.8	1.0435
0.470	0.22625	58.0	0.17581	34.5	9.88007	22.8	1.0449
0.480	0.23010	58.0	0.17581	34.5	9.87963	22.7	1.0463
0.490	0.23391	58.0	0.17581	34.5	9.87919	22.7	1.0477
0.500	0.23768	58.0	0.17581	34.5	9.87875	22.7	0.13007
0.510	0.24141	58.0	0.17581	34.5	9.87831	22.6	1.0491
0.520	0.24510	58.0	0.17581	34.5	9.87787	22.6	1.0505
0.530	0.24875	58.0	0.17581	34.5	9.87743	22.6	1.0519
0.540	0.25236	58.0	0.17581	34.5	9.87699	22.5	1.0533
0.550	0.25593	58.0	0.17581	34.5	9.87655	22.5	0.13007
0.560	0.25946	58.0	0.17581	34.5	9.87611	22.5	1.0547
0.570	0.26295	58.0	0.17581	34.5	9.87567	22.4	1.0561
0.580	0.26640	58.0	0.17581	34.5	9.87523	22.4	1.0575
0.590	0.26981	58.0	0.17581	34.5	9.87479	22.4	0.13007
0.600	0.27318	58.0	0.17581	34.5	9.87435	22.3	1.0589
0.610	0.27651	58.0	0.17581	34.5	9.87391	22.3	1.0603
0.620	0.27980	58.0	0.17581	34.5	9.87347	22.3	1.0617
0.630	0.28305	58.0	0.17581	34.5	9.87303	22.2	1.0631
0.640	0.28626	58.0	0.17581	34.5	9.87259	22.2	0.13007
0.650	0.28943	58.0	0.17581	34.5	9.87215	22.2	1.0645
0.660	0.29256	58.0	0.17581	34.5	9.87171	22.1	1.0659
0.670	0.29565	58.0	0.17581	34.5	9.87127	22.1	1.0673
0.680	0.29870	58.0	0.17581	34.5	9.87083	22.1	1.0687
0.690	0.30171	58.0	0.17581	34.5	9.87039	22.0	1.0701
0.700	0.30468	58.0	0.17581	34.5	9.86995	22.0	0.13007
0.710	0.30761	58.0	0.17581	34.5	9.86951	22.0	1.0715
0.720	0.31050	58.0	0.17581	34.5	9.86907	21.9	1.0729
0.730	0.31335	58.0	0.17581	34.5	9.86863	21.9	1.0743
0.740	0.31616	58.0	0.17581	34.5	9.86819	21.9	1.0757
0.750	0.31893	58.0	0.17581	34.5	9.86775	21.8	0.13007
0.760	0.32166	58.0	0.17581	34.5	9.86731	21.8	1.0771
0.770	0.32435	58.0	0.17581	34.5	9.86687	21.8	1.0785
0.780	0.32700	58.0	0.17581	34.5	9.86643	21.7	1.0799
0.790	0.32961	58.0	0.17581	34.5	9.86599	21.7	1.0813
0.800	0.33218	58.0	0.17581	34.5	9.86555	21.7	0.13007
0.810	0.33471	58.0	0.17581	34.5	9.86511	21.6	1.0827
0.820	0.33720	58.0	0.17581	34.5	9.86467	21.6	1.0841
0.830	0.33965	58.0	0.17581	34.5	9.86423	21.6	1.0855
0.840	0.34206	58.0	0.17581	34.5	9.86379	21.5	0.13007
0.850	0.34443	58.0	0.17581	34.5	9.86335	21.5	1.0869
0.860	0.34676	58.0	0.17581	34.5	9.86291	21.5	1.0883
0.870	0.34905	58.0	0.17581	34.5	9.86247	21.4	1.0897
0.880	0.35130	58.0	0.17581	34.5	9.86203	21.4	1.0911
0.890	0.35351	58.0	0.17581	34.5	9.86159	21.4	0.13007
0.900	0.35568	58.0	0.17581	34.5	9.86115	21.3	1.0925
0.910	0.35781	58.0	0.17581	34.5	9.86071	21.3	1.0939
0.920	0.35990	58.0	0.17581	34.5	9.86027	21.3	1.0953
0.930	0.36195	58.0	0.17581	34.5	9.85983	21.2	0.13007
0.940	0.36396	58.0	0.17581	34.5	9.85939	21.2	1.0967
0.950	0.36593	58.0	0.17581	34.5	9.85895	21.2	1.0981
0.960	0.36786	58.0	0.17581	34.5	9.85851	21.1	1.0995
0.970	0.36975	58.0	0.17581	34.5	9.85807	21.1	1.1009
0.980	0.37160	58.0	0.17581	34.5	9.85763	21.1	0.13007
0.990	0.37341	58.0	0.17581	34.5	9.85719	21.0	1.1023
1.000	0.37518	58.0	0.17581	34.5	9.85675	21.0	1.1037
u	$\log \tanh u$	$= F'$	$\log \coth u$	$= F'$	$\log \sinh u$	$= F'$	$\log \cosh u$

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
1.000	0.07011	57.0	0.18830	33.1	9.88172	23.0	0.11824
.001	.07018	57.0	.18832	33.1	.88196	23.0	.11804
.002	.07125	57.0	.18805	33.1	.88220	23.8	.11780
.003	.07182	56.9	.18808	33.1	.88244	23.8	.11756
.004	.07230	56.9	.18871	33.1	.88268	23.8	.11732
1.005	0.07296	56.9	0.19004	33.2	9.88291	23.7	0.11709
.006	.07353	56.8	.19038	33.2	.88315	23.7	.11685
.007	.07400	56.8	.19071	33.2	.88339	23.6	.11661
.008	.07466	56.8	.19104	33.2	.88362	23.6	.11638
.009	.07523	56.7	.18137	33.2	.88386	23.5	.11614
1.010	0.07580	56.7	0.19171	33.3	9.88409	23.5	0.11591
.011	.07637	56.7	.19204	33.3	.88433	23.4	.11567
.012	.07693	56.7	.19237	33.3	.88456	23.4	.11544
.013	.07750	56.6	.19270	33.3	.88480	23.3	.11520
.014	.07807	56.6	.19304	33.3	.88503	23.3	.11497
1.015	0.07863	56.6	0.19337	33.3	9.88526	23.2	0.11474
.016	.07920	56.5	.19370	33.4	.88549	23.2	.11451
.017	.07976	56.5	.19404	33.4	.88572	23.1	.11428
.018	.08033	56.5	.19437	33.4	.88595	23.1	.11405
.019	.08089	56.4	.19471	33.4	.88619	23.0	.11381
1.020	0.08146	56.4	0.19504	33.4	9.88642	23.0	0.11358
.021	.08202	56.4	.19537	33.5	.88665	23.0	.11335
.022	.08258	56.4	.19571	33.5	.88687	22.9	.11313
.023	.08315	56.3	.19604	33.5	.88710	22.8	.11290
.024	.08371	56.3	.19638	33.5	.88733	22.8	.11267
1.025	0.08427	56.3	0.19671	33.5	9.88756	22.7	0.11244
.026	.08483	56.2	.19705	33.5	.88779	22.7	.11221
.027	.08540	56.2	.19738	33.6	.88801	22.6	.11199
.028	.08596	56.2	.19772	33.6	.88824	22.6	.11176
.029	.08652	56.1	.19806	33.6	.88846	22.6	.11154
1.030	0.08708	56.1	0.19839	33.6	9.88869	22.5	0.11131
.031	.08764	56.1	.19873	33.6	.88891	22.5	.11109
.032	.08820	56.1	.19906	33.6	.88914	22.4	.11086
.033	.08876	56.0	.19940	33.7	.88936	22.4	.11064
.034	.08932	56.0	.19974	33.7	.88959	22.3	.11041
1.035	0.08988	56.0	0.20007	33.7	9.88981	22.3	0.11019
.036	.09044	55.9	.20041	33.7	.89003	22.2	.10997
.037	.09100	55.9	.20075	33.7	.89025	22.2	.10975
.038	.09156	55.9	.20109	33.7	.89048	22.1	.10952
.039	.09212	55.9	.20142	33.8	.89070	22.1	.10930
1.040	0.09268	55.8	0.20176	33.8	9.89092	22.0	0.10908
.041	.09324	55.8	.20210	33.8	.89114	22.0	.10886
.042	.09379	55.8	.20244	33.8	.89136	22.0	.10864
.043	.09435	55.7	.20278	33.8	.89158	21.9	.10842
.044	.09491	55.7	.20311	33.9	.89180	21.9	.10820
1.045	0.09547	55.7	0.20345	33.9	9.89201	21.8	0.10798
.046	.09602	55.7	.20379	33.9	.89223	21.8	.10777
.047	.09658	55.6	.20413	33.9	.89245	21.7	.10755
.048	.09714	55.6	.20447	33.9	.89267	21.7	.10733
.049	.09769	55.6	.20481	33.9	.89288	21.6	.10712
1.050	0.09825	55.6	0.20515	34.0	9.89310	21.6	0.10690
u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

u	log sinh u	= F ₁ '	log cosh u	= F ₂ '	log tanh u	= F ₃ '	log coth u
1.050	0.06823	55.6	0.20515	34.0	9.80310	21.6	0.10500
.051	.06889	55.5	.20549	34.0	.80331	21.6	.10509
.052	.06956	55.5	.20583	34.0	.80353	21.5	.10517
.053	.07021	55.5	.20617	34.0	.80375	21.5	.10525
.054	.10047	55.4	.20651	34.0	.80396	21.4	.10534
1.055	0.10102	55.4	0.20685	34.0	9.80417	21.4	0.10541
.056	.10158	55.4	.20719	34.1	.80439	21.3	.10549
.057	.10213	55.4	.20753	34.1	.80460	21.3	.10557
.058	.10268	55.3	.20787	34.1	.80481	21.2	.10565
.059	.10324	55.3	.20821	34.1	.80502	21.2	.10573
1.060	0.10379	55.3	0.20855	34.1	9.80524	21.2	0.10580
.061	.10434	55.3	.20889	34.1	.80545	21.1	.10588
.062	.10489	55.2	.20924	34.2	.80566	21.1	.10596
.063	.10545	55.2	.20958	34.2	.80587	21.0	.10604
.064	.10600	55.2	.20992	34.2	.80608	21.0	.10612
1.065	0.10655	55.1	0.21026	34.2	9.80629	20.9	0.10619
.066	.10710	55.1	.21060	34.2	.80650	20.9	.10627
.067	.10765	55.1	.21094	34.2	.80671	20.9	.10635
.068	.10820	55.1	.21129	34.2	.80692	20.8	.10643
.069	.10875	55.0	.21163	34.2	.80713	20.8	.10651
1.070	0.10930	55.0	0.21197	34.2	9.80733	20.7	0.10658
.071	.10985	55.0	.21232	34.2	.80754	20.7	.10666
.072	.11040	55.0	.21266	34.2	.80774	20.6	.10674
.073	.11095	54.9	.21300	34.2	.80795	20.6	.10682
.074	.11150	54.9	.21335	34.2	.80816	20.6	.10690
1.075	0.11205	54.9	0.21369	34.2	9.80836	20.5	0.10697
.076	.11260	54.9	.21403	34.2	.80857	20.5	.10705
.077	.11315	54.8	.21438	34.2	.80877	20.4	.10713
.078	.11370	54.8	.21472	34.2	.80898	20.4	.10721
.079	.11424	54.8	.21507	34.2	.80918	20.3	.10729
1.080	0.11479	54.8	0.21541	34.2	9.80938	20.3	0.10736
.081	.11534	54.7	.21575	34.5	.80959	20.3	.10744
.082	.11589	54.7	.21610	34.5	.80979	20.2	.10752
.083	.11643	54.7	.21644	34.5	.80999	20.2	.10760
.084	.11698	54.7	.21679	34.5	.81019	20.1	.10768
1.085	0.11753	54.6	0.21713	34.5	9.81039	20.1	0.10775
.086	.11807	54.6	.21748	34.5	.81059	20.1	.10783
.087	.11862	54.6	.21782	34.6	.81079	20.0	.10791
.088	.11916	54.5	.21817	34.6	.81099	20.0	.10799
.089	.11971	54.5	.21852	34.6	.81119	19.9	.10807
1.090	0.12025	54.5	0.21886	34.6	9.81139	19.9	0.10814
.091	.12080	54.5	.21921	34.6	.81159	19.9	.10822
.092	.12134	54.4	.21955	34.6	.81179	19.8	.10830
.093	.12189	54.4	.21990	34.7	.81199	19.8	.10838
.094	.12243	54.4	.22025	34.7	.81218	19.7	.10846
1.095	0.12298	54.4	0.22059	34.7	9.81238	19.7	0.10853
.096	.12352	54.4	.22094	34.7	.81258	19.6	.10861
.097	.12406	54.3	.22129	34.7	.81277	19.6	.10869
.098	.12461	54.3	.22163	34.7	.81297	19.5	.10877
.099	.12515	54.3	.22198	34.7	.81317	19.5	.10885
1.100	0.12569	54.3	0.22233	34.8	9.81336	19.5	0.10892
u	log tanh u	= F ₁ '	log coth u	= F ₂ '	log tanh u	= F ₃ '	log coth u

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$u \text{ } ^\circ$	$\log \cosh u$	$u \text{ } ^\circ$	$\log \tanh u$	$u \text{ } ^\circ$	$\log \coth u$
1.100	0.12959	54.3	0.22533	33.8	0.09574	10.5	0.09964
1.101	0.12963	54.2	0.22537	33.8	0.09578	10.4	0.09968
1.102	0.12968	54.2	0.22541	33.8	0.09582	10.4	0.09972
1.103	0.12972	54.2	0.22545	33.8	0.09586	10.4	0.09976
1.104	0.12976	54.2	0.22549	33.8	0.09590	10.4	0.09980
1.105	0.12980	54.1	0.22553	33.8	0.09594	10.3	0.09984
1.106	0.12984	54.1	0.22557	33.8	0.09598	10.3	0.09988
1.107	0.12988	54.1	0.22561	33.8	0.09602	10.3	0.09992
1.108	0.12992	54.1	0.22565	33.8	0.09606	10.3	0.09996
1.109	0.12996	54.0	0.22569	33.8	0.09610	10.3	0.09999
1.110	0.13100	53.9	0.22673	33.7	0.09714	10.2	0.10104
1.111	0.13104	53.9	0.22677	33.7	0.09718	10.2	0.10108
1.112	0.13108	53.9	0.22681	33.7	0.09722	10.2	0.10112
1.113	0.13112	53.9	0.22685	33.7	0.09726	10.2	0.10116
1.114	0.13116	53.9	0.22689	33.7	0.09730	10.2	0.10120
1.115	0.13180	53.8	0.22793	33.7	0.09834	10.1	0.10224
1.116	0.13184	53.8	0.22797	33.7	0.09838	10.1	0.10228
1.117	0.13188	53.8	0.22801	33.7	0.09842	10.1	0.10232
1.118	0.13192	53.8	0.22805	33.7	0.09846	10.1	0.10236
1.119	0.13196	53.8	0.22809	33.7	0.09850	10.1	0.10240
1.120	0.13260	53.7	0.22913	33.6	0.09954	10.0	0.10344
1.121	0.13264	53.7	0.22917	33.6	0.09958	10.0	0.10348
1.122	0.13268	53.7	0.22921	33.6	0.09962	10.0	0.10352
1.123	0.13272	53.7	0.22925	33.6	0.09966	10.0	0.10356
1.124	0.13276	53.7	0.22929	33.6	0.09970	10.0	0.10360
1.125	0.13340	53.6	0.23033	33.5	0.10074	9.9	0.10464
1.126	0.13344	53.6	0.23037	33.5	0.10078	9.9	0.10468
1.127	0.13348	53.6	0.23041	33.5	0.10082	9.9	0.10472
1.128	0.13352	53.6	0.23045	33.5	0.10086	9.9	0.10476
1.129	0.13356	53.6	0.23049	33.5	0.10090	9.9	0.10480
1.130	0.13420	53.5	0.23153	33.4	0.10194	9.8	0.10584
1.131	0.13424	53.5	0.23157	33.4	0.10198	9.8	0.10588
1.132	0.13428	53.5	0.23161	33.4	0.10202	9.8	0.10592
1.133	0.13432	53.5	0.23165	33.4	0.10206	9.8	0.10596
1.134	0.13436	53.5	0.23169	33.4	0.10210	9.8	0.10600
1.135	0.13500	53.4	0.23273	33.3	0.10314	9.7	0.10704
1.136	0.13504	53.4	0.23277	33.3	0.10318	9.7	0.10708
1.137	0.13508	53.4	0.23281	33.3	0.10322	9.7	0.10712
1.138	0.13512	53.4	0.23285	33.3	0.10326	9.7	0.10716
1.139	0.13516	53.3	0.23289	33.3	0.10330	9.7	0.10720
1.140	0.13580	53.3	0.23393	33.2	0.10434	9.6	0.10824
1.141	0.13584	53.3	0.23397	33.2	0.10438	9.6	0.10828
1.142	0.13588	53.3	0.23401	33.2	0.10442	9.6	0.10832
1.143	0.13592	53.3	0.23405	33.2	0.10446	9.6	0.10836
1.144	0.13596	53.2	0.23409	33.2	0.10450	9.6	0.10840
1.145	0.13660	53.2	0.23513	33.1	0.10554	9.5	0.10944
1.146	0.13664	53.2	0.23517	33.1	0.10558	9.5	0.10948
1.147	0.13668	53.2	0.23521	33.1	0.10562	9.5	0.10952
1.148	0.13672	53.2	0.23525	33.1	0.10566	9.5	0.10956
1.149	0.13676	53.1	0.23529	33.1	0.10570	9.5	0.10960
1.150	0.13740	53.1	0.23633	33.0	0.10674	9.4	0.11064
1.151	0.13744	53.1	0.23637	33.0	0.10678	9.4	0.11068
1.152	0.13748	53.1	0.23641	33.0	0.10682	9.4	0.11072
1.153	0.13752	53.1	0.23645	33.0	0.10686	9.4	0.11076
1.154	0.13756	53.0	0.23649	33.0	0.10690	9.4	0.11080

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
1.150	0.15253	53.1	0.29999	35.5	0.01262	17.6	0.08738
1.151	0.15261	53.1	0.29996	35.5	0.01260	17.6	0.08720
1.152	0.15269	53.1	0.29991	35.5	0.01257	17.5	0.08703
1.153	0.15277	53.0	0.29987	35.0	0.01215	17.5	0.08685
1.154	0.15285	53.0	0.29983	35.0	0.01212	17.5	0.08668
1.155	0.15293	53.0	0.29978	35.0	0.01210	17.4	0.08650
1.156	0.15301	53.0	0.29974	35.0	0.01207	17.4	0.08633
1.157	0.15309	53.0	0.29969	35.0	0.01205	17.3	0.08615
1.158	0.15317	53.0	0.29965	35.0	0.01202	17.3	0.08598
1.159	0.15325	53.0	0.29961	35.0	0.01200	17.3	0.08581
1.160	0.15333	53.0	0.29956	35.2	0.01436	17.2	0.08564
1.161	0.15341	53.0	0.29952	35.2	0.01451	17.2	0.08546
1.162	0.15349	53.0	0.29948	35.2	0.01471	17.2	0.08529
1.163	0.15357	53.0	0.29943	35.2	0.01488	17.1	0.08512
1.164	0.15365	53.0	0.29939	35.2	0.01505	17.1	0.08495
1.165	0.15373	53.0	0.29934	35.2	0.01522	17.1	0.08478
1.166	0.15381	53.0	0.29930	35.2	0.01520	17.0	0.08461
1.167	0.15389	52.7	0.29926	35.8	0.01556	17.0	0.08444
1.168	0.15397	52.7	0.29922	35.8	0.01573	17.0	0.08427
1.169	0.15405	52.7	0.29918	35.8	0.01590	16.9	0.08410
1.170	0.15413	52.7	0.29913	35.8	0.01607	16.9	0.08393
1.171	0.15421	52.7	0.29909	35.8	0.01624	16.9	0.08376
1.172	0.15429	52.0	0.29905	35.8	0.01641	16.8	0.08359
1.173	0.15437	52.0	0.29901	35.8	0.01658	16.8	0.08342
1.174	0.15445	52.0	0.29897	35.0	0.01674	16.8	0.08325
1.175	0.15453	52.6	0.29893	35.0	0.01691	16.7	0.08309
1.176	0.15461	52.6	0.29889	35.0	0.01708	16.7	0.08292
1.177	0.15469	52.5	0.29885	35.0	0.01724	16.7	0.08275
1.178	0.15477	52.5	0.29881	35.0	0.01741	16.6	0.08259
1.179	0.15485	52.5	0.29876	35.0	0.01758	16.6	0.08242
1.180	0.15493	52.5	0.29872	35.0	0.01774	16.6	0.08225
1.181	0.15501	52.5	0.29868	35.0	0.01791	16.5	0.08209
1.182	0.15509	52.4	0.29864	35.0	0.01807	16.5	0.08193
1.183	0.15517	52.4	0.29860	35.0	0.01824	16.4	0.08176
1.184	0.15525	52.4	0.29856	35.0	0.01840	16.4	0.08160
1.185	0.15533	52.4	0.29852	35.0	0.01857	16.4	0.08143
1.186	0.15541	52.4	0.29848	35.0	0.01873	16.3	0.08127
1.187	0.15549	52.3	0.29844	35.0	0.01889	16.3	0.08111
1.188	0.15557	52.3	0.29840	35.0	0.01906	16.3	0.08095
1.189	0.15565	52.3	0.29836	35.1	0.01922	16.2	0.08078
1.190	0.15573	52.3	0.29832	35.1	0.01939	16.2	0.08062
1.191	0.15581	52.3	0.29828	35.1	0.01955	16.2	0.08046
1.192	0.15589	52.2	0.29824	35.1	0.01970	16.2	0.08030
1.193	0.15597	52.2	0.29820	35.1	0.01987	16.1	0.08013
1.194	0.15605	52.2	0.29816	35.1	0.02003	16.1	0.07997
1.195	0.15613	52.2	0.29812	35.1	0.02019	16.1	0.07981
1.196	0.15621	52.2	0.29808	35.2	0.02035	16.0	0.07965
1.197	0.15629	52.2	0.29804	35.2	0.02051	16.0	0.07949
1.198	0.15637	52.1	0.29800	35.2	0.02067	16.0	0.07933
1.199	0.15645	52.1	0.29797	35.2	0.02083	16.0	0.07917
1.200	0.15653	52.1	0.29793	35.2	0.02099	16.0	0.07901
u	$\log \tanh u$	$= F_1'$	$\log \coth u$	$= F_2'$	$\log \sinh u$	$= F_3'$	$\log \cosh u$

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
1.300	0.23004	50.4	0.24167	37.4	0.01163	1.50	0.009161
.301	.23054	50.4	.24204	37.4	.01200	1.50	.009350
.302	.23104	50.4	.24242	37.4	.01237	1.50	.009537
.303	.23155	50.4	.24279	37.5	.01275	1.50	.009724
.304	.23205	50.4	.24317	37.5	.01312	1.50	.009912
1.305	0.23255	50.3	0.24354	37.5	0.01350	1.50	0.010100
.306	.23306	50.3	.24391	37.5	.01387	1.50	.010289
.307	.23356	50.3	.24429	37.5	.01425	1.50	.010475
.308	.23406	50.3	.24467	37.5	.01462	1.50	.010660
.309	.23457	50.3	.24504	37.5	.01500	1.50	.010848
1.310	0.23507	50.3	0.24541	37.5	0.01537	1.50	0.011035
.311	.23557	50.2	.24579	37.5	.01575	1.50	.011224
.312	.23607	50.2	.24617	37.6	.01612	1.50	.011410
.313	.23657	50.2	.24655	37.6	.01650	1.50	.011597
.314	.23708	50.2	.24692	37.6	.01687	1.50	.011784
1.315	0.23758	50.2	0.24730	37.6	0.01725	1.50	0.011972
.316	.23808	50.2	.24767	37.6	.01762	1.50	.012159
.317	.23858	50.1	.24805	37.6	.01800	1.50	.012346
.318	.23908	50.1	.24842	37.6	.01837	1.50	.012534
.319	.23958	50.1	.24880	37.6	.01875	1.50	.012721
1.320	0.24008	50.1	0.24917	37.6	0.01912	1.50	0.012909
.321	.24059	50.1	.24955	37.7	.01950	1.50	.013096
.322	.24109	50.1	.24993	37.7	.01987	1.50	.013284
.323	.24159	50.1	.25030	37.7	.02025	1.50	.013472
.324	.24209	50.0	.25068	37.7	.02062	1.50	.013659
1.325	0.24259	50.0	0.25105	37.7	0.02100	1.50	0.013847
.326	.24309	50.0	.25143	37.7	.02137	1.50	.014035
.327	.24359	50.0	.25181	37.7	.02175	1.50	.014224
.328	.24409	50.0	.25219	37.7	.02212	1.50	.014410
.329	.24459	50.0	.25257	37.7	.02250	1.50	.014598
1.330	0.24509	50.0	0.25294	37.8	0.02287	1.50	0.014786
.331	.24559	49.9	.25332	37.8	.02325	1.50	.014973
.332	.24609	49.9	.25370	37.8	.02362	1.50	.015161
.333	.24659	49.9	.25408	37.8	.02400	1.50	.015348
.334	.24709	49.9	.25446	37.8	.02437	1.50	.015536
1.335	0.24759	49.9	0.25484	37.8	0.02475	1.50	0.015724
.336	.24808	49.9	.25521	37.8	.02512	1.50	.015912
.337	.24858	49.9	.25559	37.8	.02550	1.50	.016100
.338	.24908	49.9	.25597	37.8	.02587	1.50	.016288
.339	.24958	49.8	.25635	37.8	.02625	1.50	.016475
1.340	0.25008	49.8	0.25672	37.9	0.02662	1.50	0.016663
.341	.25058	49.8	.25710	37.9	.02700	1.50	.016851
.342	.25107	49.8	.25748	37.9	.02737	1.50	.017039
.343	.25157	49.8	.25786	37.9	.02775	1.50	.017227
.344	.25207	49.8	.25824	37.9	.02812	1.50	.017414
1.345	0.25257	49.8	0.25862	37.9	0.02850	1.50	0.017602
.346	.25306	49.7	.25900	37.9	.02887	1.50	.017790
.347	.25356	49.7	.25938	37.9	.02925	1.50	.017978
.348	.25406	49.7	.25976	37.9	.02962	1.50	.018166
.349	.25456	49.7	.26014	37.9	.03000	1.50	.018354
1.350	0.25505	49.7	0.26052	38.0	0.03037	1.50	0.018542
u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

u	log sinh u	= F'	log cosh u	= F'	log tanh u	= F'	log coth u
1.400	0.27074	49.1	0.32262	38.5	9.94712	10.6	0.05288
.401	.28032	49.0	.32200	38.5	.94722	10.6	.05278
.402	.28072	49.0	.32139	38.5	.94733	10.6	.05269
.403	.28121	49.0	.32077	38.5	.94743	10.6	.05259
.404	.28170	49.0	.32016	38.5	.94754	10.6	.05249
1.405	0.28219	49.0	0.31954	38.5	9.94764	10.5	0.05239
.406	.28268	49.0	.31893	38.5	.94775	10.5	.05229
.407	.28317	49.0	.31831	38.5	.94785	10.5	.05219
.408	.28366	49.0	.31770	38.5	.94796	10.5	.05209
.409	.28415	49.0	.31708	38.5	.94806	10.5	.05199
1.410	0.28464	48.9	0.31647	38.5	9.94817	10.5	0.05189
.411	.28512	48.9	.31586	38.6	.94827	10.5	.05179
.412	.28561	48.9	.31524	38.6	.94837	10.5	.05169
.413	.28610	48.9	.31463	38.6	.94848	10.5	.05159
.414	.28659	48.9	.31401	38.6	.94858	10.5	.05149
1.415	0.28708	48.9	0.31340	38.6	9.94868	10.5	0.05139
.416	.28757	48.9	.31278	38.6	.94879	10.5	.05129
.417	.28806	48.9	.31217	38.6	.94889	10.5	.05119
.418	.28855	48.8	.31156	38.6	.94899	10.5	.05109
.419	.28903	48.8	.31094	38.6	.94909	10.5	.05099
1.420	0.28952	48.8	0.31033	38.6	9.94919	10.5	0.05089
.421	.29001	48.8	.30971	38.6	.94930	10.5	.05079
.422	.29050	48.8	.30910	38.7	.94940	10.5	.05069
.423	.29099	48.8	.30849	38.7	.94950	10.5	.05059
.424	.29147	48.8	.30787	38.7	.94960	10.5	.05049
1.425	0.29196	48.8	0.30726	38.7	9.94970	10.5	0.05039
.426	.29245	48.8	.30665	38.7	.94980	10.5	.05029
.427	.29294	48.7	.30603	38.7	.94990	10.5	.05019
.428	.29342	48.7	.30542	38.7	.95000	10.5	.05009
.429	.29391	48.7	.30481	38.7	.95010	10.5	.04999
1.430	0.29440	48.7	0.30420	38.7	9.95020	10.5	0.04989
.431	.29489	48.7	.30358	38.7	.95030	10.5	.04979
.432	.29537	48.7	.30297	38.7	.95040	10.5	.04969
.433	.29586	48.7	.30235	38.8	.95050	10.5	.04959
.434	.29635	48.7	.30174	38.8	.95060	10.5	.04949
1.435	0.29683	48.7	0.30113	38.8	9.95070	10.5	0.04939
.436	.29732	48.6	.30052	38.8	.95080	10.5	.04929
.437	.29781	48.6	.30001	38.8	.95090	10.5	.04919
.438	.29829	48.6	.30040	38.8	.95100	10.5	.04909
.439	.29878	48.6	.30079	38.8	.95110	10.5	.04899
1.440	0.29926	48.6	0.30017	38.8	9.95120	10.5	0.04889
.441	.29975	48.6	.30056	38.8	.95130	10.5	.04879
.442	.30024	48.6	.30095	38.8	.95140	10.5	.04869
.443	.30072	48.6	.30134	38.8	.95150	10.5	.04859
.444	.30121	48.6	.30173	38.8	.95160	10.5	.04849
1.445	0.30169	48.5	0.30112	38.9	9.95170	10.5	0.04839
.446	.30218	48.5	.30151	38.9	.95180	10.5	.04829
.447	.30266	48.5	.30190	38.9	.95190	10.5	.04819
.448	.30315	48.5	.30229	38.9	.95200	10.5	.04809
.449	.30363	48.5	.30268	38.9	.95210	10.5	.04799
1.450	0.30412	48.5	0.30306	38.9	9.95220	10.5	0.04789
u	log tan gd u	= F'	log sec gd u	= F'	log csc gd u	= F'	log cot gd u

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

u	log sinh u	= F'	log cosh u	= F'	log tanh u	= F'	log coth u
1.450	0.30412	48.5	0.35196	38.0	9.95216	9.0	0.04784
1.451	.30460	48.5	.35235	38.0	.95245	9.0	.04773
1.452	.30509	48.5	.35274	38.0	.95273	9.0	.04762
1.453	.30557	48.5	.35313	38.0	.95302	9.0	.04751
1.454	.30606	48.4	.35352	38.0	.95331	9.0	.04740
1.455	0.30654	48.4	0.35391	38.0	9.95264	9.5	0.04736
1.456	.30703	48.4	.35429	38.0	.95273	9.5	.04722
1.457	.30751	48.4	.35468	38.0	.95281	9.5	.04717
1.458	.30799	48.4	.35507	38.0	.95292	9.4	.04708
1.459	.30848	48.4	.35546	38.0	.95304	9.4	.04699
1.460	0.30896	48.4	0.35585	38.0	9.95311	9.4	0.04690
1.461	.30945	48.4	.35624	38.0	.95320	9.4	.04680
1.462	.30993	48.4	.35663	38.0	.95330	9.4	.04670
1.463	.31041	48.3	.35702	38.0	.95339	9.3	.04661
1.464	.31090	48.3	.35741	38.0	.95348	9.3	.04652
1.465	0.31138	48.3	0.35780	38.0	9.95358	9.3	0.04642
1.466	.31186	48.3	.35819	38.0	.95367	9.3	.04633
1.467	.31235	48.3	.35858	38.0	.95376	9.3	.04624
1.468	.31283	48.3	.35897	38.1	.95385	9.2	.04615
1.469	.31331	48.3	.35937	38.1	.95395	9.2	.04605
1.470	0.31379	48.3	0.35976	38.1	9.95404	9.2	0.04596
1.471	.31428	48.3	.36015	38.1	.95413	9.2	.04587
1.472	.31476	48.3	.36055	38.1	.95422	9.2	.04578
1.473	.31524	48.2	.36093	38.1	.95431	9.2	.04569
1.474	.31572	48.2	.36132	38.1	.95441	9.1	.04559
1.475	0.31621	48.2	0.36171	38.1	9.95450	9.1	0.04550
1.476	.31669	48.2	.36210	38.1	.95459	9.1	.04541
1.477	.31717	48.2	.36249	38.1	.95468	9.1	.04532
1.478	.31765	48.2	.36288	38.1	.95477	9.1	.04523
1.479	.31814	48.2	.36328	38.1	.95486	9.0	.04514
1.480	0.31862	48.2	0.36367	38.2	9.95495	9.0	0.04505
1.481	.31910	48.2	.36406	38.2	.95504	9.0	.04496
1.482	.31958	48.2	.36445	38.2	.95513	9.0	.04487
1.483	.32006	48.1	.36484	38.2	.95522	9.0	.04478
1.484	.32054	48.1	.36523	38.2	.95531	9.0	.04469
1.485	0.32102	48.1	0.36561	38.2	9.95540	8.9	0.04460
1.486	.32151	48.1	.36602	38.2	.95549	8.9	.04451
1.487	.32199	48.1	.36641	38.2	.95558	8.9	.04442
1.488	.32247	48.1	.36680	38.2	.95567	8.9	.04433
1.489	.32295	48.1	.36719	38.2	.95576	8.9	.04424
1.490	0.32343	48.1	0.36758	38.2	9.95584	8.8	0.04416
1.491	.32391	48.1	.36798	38.2	.95593	8.8	.04407
1.492	.32439	48.1	.36837	38.2	.95602	8.8	.04398
1.493	.32487	48.0	.36876	38.3	.95611	8.8	.04389
1.494	.32535	48.0	.36916	38.3	.95620	8.8	.04380
1.495	0.32583	48.0	0.36955	38.3	9.95628	8.8	0.04372
1.496	.32631	47.9	.36994	38.3	.95637	8.7	.04363
1.497	.32679	48.0	.37033	38.3	.95646	8.7	.04354
1.498	.32727	48.0	.37073	38.3	.95655	8.7	.04345
1.499	.32775	48.0	.37112	38.3	.95663	8.7	.04337
1.500	0.32823	48.0	0.37151	38.3	9.95672	8.7	0.04328
u	log tanh u	= F'	log coth u	= F'	log sinh u	= F'	log cosh u

Logarithms of Hyperbolic Functions.

x	$\log \sinh x$	$\equiv F_1'$	$\log \cosh x$	$\equiv F_2'$	$\log \tanh x$	$\equiv F_3'$	$\log \coth x$
1.500	0.32813	47.0	0.37151	39.3	0.05072	8.7	0.001428
.501	.32871	47.0	.37199	39.3	.05108	8.7	.001459
.502	.32910	47.0	.37240	39.3	.05146	8.7	.001491
.503	.32949	47.0	.37281	39.3	.05184	8.7	.001522
.504	.32985	47.0	.37320	39.3	.05222	8.7	.001554
1.505	0.33031	47.0	0.37361	39.3	0.05263	8.7	0.001585
.506	.33111	47.0	.37407	39.3	.05304	8.7	.001616
.507	.33190	47.0	.37447	39.3	.05342	8.7	.001648
.508	.33269	47.0	.37489	39.3	.05381	8.7	.001679
.509	.33355	47.0	.37535	39.3	.05420	8.7	.001710
1.510	0.33391	47.0	0.37575	39.3	0.05462	8.7	0.001742
.511	.33391	47.0	.37611	39.3	.05500	8.7	.001774
.512	.33436	47.0	.37651	39.3	.05538	8.7	.001805
.513	.33481	47.0	.37691	39.3	.05576	8.7	.001837
.514	.33524	47.0	.37732	39.3	.05615	8.7	.001868
1.515	0.33542	47.8	0.37744	39.3	0.05630	8.1	0.001880
.516	.33590	47.8	.37781	39.3	.05668	8.1	.001912
.517	.33638	47.8	.37821	39.3	.05707	8.1	.001943
.518	.33685	47.8	.37860	39.3	.05745	8.1	.001975
.519	.33733	47.8	.37900	39.3	.05784	8.1	.002006
1.520	0.33761	47.8	0.37930	39.5	0.05814	8.1	0.002018
.521	.33809	47.8	.37969	39.5	.05852	8.1	.002050
.522	.33857	47.8	.38008	39.5	.05890	8.1	.002081
.523	.33904	47.8	.38047	39.5	.05928	8.1	.002113
.524	.33952	47.8	.38087	39.5	.05967	8.1	.002144
1.525	0.34000	47.7	0.38140	39.5	0.05984	8.1	0.002156
.526	.34068	47.7	.38176	39.5	.06022	8.1	.002187
.527	.34115	47.7	.38213	39.5	.06060	8.1	.002219
.528	.34163	47.7	.38253	39.5	.06098	8.1	.002250
.529	.34211	47.7	.38295	39.5	.06136	8.1	.002281
1.530	0.34258	47.7	0.38331	39.5	0.06164	8.1	0.002293
.531	.34306	47.7	.38374	39.5	.06202	8.1	.002324
.532	.34354	47.7	.38413	39.6	.06240	8.1	.002356
.533	.34402	47.7	.38453	39.6	.06278	8.1	.002387
.534	.34449	47.7	.38493	39.6	.06316	8.1	.002419
1.535	0.34497	47.7	0.38532	39.6	0.06346	8.1	0.002431
.536	.34545	47.6	.38571	39.6	.06384	8.1	.002462
.537	.34594	47.6	.38611	39.6	.06422	8.1	.002494
.538	.34640	47.6	.38651	39.6	.06460	8.1	.002525
.539	.34687	47.6	.38691	39.6	.06498	8.1	.002557
1.540	0.34735	47.6	0.38730	39.6	0.06528	8.0	0.002569
.541	.34783	47.6	.38769	39.6	.06566	8.0	.002600
.542	.34830	47.6	.38809	39.6	.06604	8.0	.002632
.543	.34878	47.6	.38849	39.6	.06642	8.0	.002663
.544	.34925	47.6	.38888	39.6	.06680	8.0	.002695
1.545	0.34973	47.6	0.38928	39.6	0.06709	8.0	0.002707
.546	.35021	47.6	.38968	39.7	.06747	8.0	.002738
.547	.35068	47.6	.39007	39.7	.06785	8.0	.002770
.548	.35116	47.5	.39047	39.7	.06823	8.0	.002801
.549	.35163	47.5	.39087	39.7	.06861	8.0	.002833
1.550	0.35211	47.5	0.39126	39.7	0.06881	8.0	0.002845
x	$\log \tanh x$	$\equiv F_1'$	$\log \coth x$	$\equiv F_2'$	$\log \sinh x$	$\equiv F_3'$	$\log \cosh x$

SMITHSONIAN TABLE

Logarithms of Hyperbolic Functions.

u	log sinh u	= F ₁ '	log cosh u	= F ₂ '	log tanh u	= F ₃ '	log coth u
1.550	0.35411	47.5	0.39126	39.7	9.96881	7.8	0.03916
.551	.35498	47.5	.39166	39.7	.96922	7.8	.03956
.552	.35505	47.5	.39206	39.7	.96960	7.8	.03996
.553	.35533	47.5	.39245	39.7	.96998	7.8	.04036
.554	.35561	47.5	.39283	39.7	.97036	7.8	.04076
1.555	0.35498	47.5	0.39325	39.7	9.97123	7.8	0.04177
.556	.35496	47.5	.39366	39.7	.97131	7.7	.04199
.557	.35543	47.5	.39404	39.7	.97139	7.7	.04261
.558	.35591	47.5	.39444	39.7	.97147	7.7	.04323
.559	.35638	47.5	.39484	39.7	.97154	7.7	.04385
1.560	0.35686	47.4	0.39524	39.8	9.97162	7.7	0.04438
.561	.35733	47.4	.39563	39.8	.97170	7.7	.04490
.562	.35780	47.4	.39603	39.8	.97177	7.7	.04543
.563	.35828	47.4	.39643	39.8	.97185	7.6	.04595
.564	.35875	47.4	.39683	39.8	.97193	7.6	.04647
1.565	0.35923	47.4	0.39722	39.8	9.97200	7.6	0.04700
.566	.35970	47.4	.39762	39.8	.97208	7.6	.04752
.567	.36017	47.4	.39802	39.8	.97215	7.6	.04805
.568	.36065	47.4	.39842	39.8	.97223	7.6	.04857
.569	.36112	47.4	.39882	39.8	.97231	7.5	.04909
1.570	0.36160	47.4	0.39921	39.8	9.97238	7.5	0.04962
.571	.36207	47.4	.39961	39.8	.97246	7.5	.05014
.572	.36254	47.3	.40001	39.8	.97253	7.5	.05067
.573	.36302	47.3	.40041	39.8	.97261	7.5	.05119
.574	.36349	47.3	.40081	39.9	.97268	7.5	.05172
1.575	0.36396	47.3	0.40121	39.9	9.97276	7.5	0.05224
.576	.36444	47.3	.40161	39.9	.97283	7.4	.05277
.577	.36491	47.3	.40200	39.9	.97291	7.4	.05329
.578	.36538	47.3	.40240	39.9	.97298	7.4	.05382
.579	.36585	47.3	.40280	39.9	.97305	7.4	.05435
1.580	0.36633	47.3	0.40320	39.9	9.97313	7.4	0.05487
.581	.36680	47.3	.40360	39.9	.97320	7.4	.05540
.582	.36727	47.3	.40400	39.9	.97327	7.4	.05593
.583	.36775	47.3	.40440	39.9	.97335	7.3	.05645
.584	.36822	47.2	.40480	39.9	.97342	7.3	.05698
1.585	0.36869	47.2	0.40520	39.9	9.97349	7.3	0.05751
.586	.36916	47.2	.40560	39.9	.97357	7.3	.05803
.587	.36964	47.2	.40600	39.9	.97364	7.3	.05856
.588	.37011	47.2	.40640	39.9	.97371	7.3	.05909
.589	.37058	47.2	.40679	40.0	.97379	7.3	.05961
1.590	0.37105	47.2	0.40719	40.0	9.97386	7.2	0.06014
.591	.37152	47.2	.40759	40.0	.97393	7.2	.06067
.592	.37200	47.2	.40799	40.0	.97400	7.2	.06120
.593	.37247	47.2	.40839	40.0	.97407	7.2	.06173
.594	.37294	47.2	.40879	40.0	.97415	7.2	.06225
1.595	0.37341	47.2	0.40919	40.0	9.97422	7.2	0.06278
.596	.37388	47.2	.40959	40.0	.97429	7.2	.06331
.597	.37435	47.1	.40999	40.0	.97436	7.1	.06384
.598	.37482	47.1	.41039	40.0	.97443	7.1	.06437
.599	.37530	47.1	.41079	40.0	.97450	7.1	.06489
1.600	0.37577	47.1	0.41119	40.0	9.97457	7.1	0.06543
u	log tanh u	= F ₁	log coth u	= F ₂	log sinh u	= F ₃	log cosh u

Logarithms of Hyperbolic Functions.

u	log sinh u	= F'	log cosh u	= F'	log tanh u	= F'	log coth u
1.000	0.27377	47.1	0.41119	49.9	0.000157	7.1	0.000154
.001	.27384		.41122		.000165		.000155
.002	.27391		.41126		.000172		.000156
.003	.27398		.41130		.000179		.000157
.004	.27405		.41133	49.1	.000186	7.0	.000158
1.005	0.27412	47.1	0.41139	49.1	0.000193	7.0	0.000159
.006	.27419		.41140		.000199		.000160
.007	.27426		.41146		.000207		.000161
.008	.27433		.41149		.000214		.000162
.009	.27440		.41150		.000221		.000163
1.010	0.27448	47.0	0.41152	49.1	0.000228	7.0	0.000164
.011	.27455		.41156		.000235	6.9	.000165
.012	.27462		.41160		.000242		.000166
.013	.27469		.41164		.000248		.000167
.014	.27476		.41168		.000255		.000168
1.015	0.27483	47.0	0.41172	49.1	0.000262	6.9	0.000169
.016	.27490		.41176		.000269		.000170
.017	.27497		.41181		.000276		.000171
.018	.27504		.41184		.000283	6.8	.000172
.019	.27511		.41188		.000290		.000173
1.020	0.27518	47.0	0.41192	49.2	0.000297	6.8	0.000174
.021	.27525		.41196		.000304		.000175
.022	.27532		.41200		.000310		.000176
.023	.27539	46.9	.41204		.000317		.000177
.024	.27546		.41208		.000324		.000178
1.025	0.27553	46.9	0.41212	49.2	0.000331	6.7	0.000179
.026	.27560		.41216		.000337		.000180
.027	.27567		.41220		.000344		.000181
.028	.27574		.41223		.000351		.000182
.029	.27581		.41228		.000357		.000183
1.030	0.27588	46.9	0.41232	49.2	0.000364	6.7	0.000184
.031	.27595		.41236		.000371		.000185
.032	.27602		.41240		.000377		.000186
.033	.27609		.41244		.000384	6.6	.000187
.034	.27616		.41248		.000391		.000188
1.035	0.27623	46.9	0.41252	49.2	0.000397	6.6	0.000189
.036	.27630		.41256		.000404		.000190
.037	.27637	46.8	.41260		.000410		.000191
.038	.27644		.41264		.000417		.000192
.039	.27651		.41268		.000424		.000193
1.040	0.27658	46.8	0.41272	49.3	0.000431	6.5	0.000194
.041	.27665		.41276		.000437		.000195
.042	.27672		.41280		.000444		.000196
.043	.27679		.41284		.000451		.000197
.044	.27686		.41288		.000457		.000198
1.045	0.27693	46.8	0.41292	49.3	0.000464	6.5	0.000199
.046	.27700		.41296		.000470		.000200
.047	.27707		.41300		.000477		.000201
.048	.27714		.41304		.000484	6.4	.000202
.049	.27721		.41308		.000491		.000203
1.050	0.27728	46.8	0.41312	49.3	0.000497	6.4	0.000204
u	log tan u	= F'	log sec u	= F'	log sin u	= F'	log cot u

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

u	log sinh u	= F'	log cosh u	= F'	log tanh u	= F'	log coth u
1.650	0.30923	46.8	0.41129	40.3	9.96793	6.4	0.03205
.651	.30970		.41160		.96801		.03199
.652	.40017	46.7	.41190	40.4	.96808		.03192
.653	.40064		.41220		.96814		.03185
.654	.40110		.41250		.96820		.03178
1.655	0.40157	46.7	0.41330	40.4	9.96847	6.4	0.03173
.656	.40204		.41371		.96853	6.3	.03167
.657	.40251		.41411		.96860		.03160
.658	.40297		.41451		.96866		.03154
.659	.40344		.41492		.96872		.03148
1.660	0.40391	46.7	0.41532	40.4	9.96898	6.3	0.03142
.661	.40437		.41573		.96905		.03135
.662	.40484		.41613		.96911		.03129
.663	.40531		.41653		.96917		.03123
.664	.40577		.41694		.96923	6.2	.03117
1.665	0.40624	46.7	0.41734	40.4	9.96949	6.2	0.03110
.666	.40671	46.6	.41775		.96956		.03104
.667	.40717		.41815		.96962		.03098
.668	.40764		.41856		.96968		.03092
.669	.40811		.41896	40.3	.96975		.03085
1.670	0.40857	46.6	0.41937	40.3	9.96991	6.2	0.03079
.671	.40904		.41977		.97007		.03073
.672	.40950		.42017		.97013	6.1	.03067
.673	.40997		.42058		.97019		.03061
.674	.41044		.42098		.97025		.03055
1.675	0.41090	46.6	0.42139	40.3	9.97051	6.1	0.03049
.676	.41137		.42179		.97057		.03043
.677	.41183		.42220		.97064		.03036
.678	.41230		.42260		.97070		.03030
.679	.41277		.42301		.97076		.03024
1.680	0.41323	46.6	0.42341	40.3	9.97082	6.0	0.03018
.681	.41370	46.5	.42382		.97088		.03012
.682	.41416		.42422		.97094		.03006
.683	.41463		.42463		.97100		.03000
.684	.41509		.42503		.97106		.02994
1.685	0.41555	46.5	0.42544	40.3	9.97012	6.0	0.02988
.686	.41602		.42585		.97018		.02982
.687	.41649		.42625	40.6	.97024		.02976
.688	.41695		.42666		.97030	5.9	.02970
.689	.41742		.42706		.97036		.02964
1.690	0.41788	46.5	0.42747	40.6	9.97042	5.9	0.02958
.691	.41835		.42787		.97047		.02953
.692	.41881		.42828		.97053		.02947
.693	.41928		.42869		.97059		.02941
.694	.41974		.42909		.97065		.02935
1.695	0.42021	46.5	0.42950	40.6	9.97071	5.9	0.02929
.696	.42067		.42990		.97077		.02923
.697	.42114	46.4	.43031		.97083	5.8	.02917
.698	.42160		.43072		.97089		.02911
.699	.42207		.43112		.97094		.02905
1.700	0.42253	46.4	0.43153	40.6	9.97100	5.8	0.02900
u	log tanh u	= F'	log coth u	= F'	log tanh u	= F'	log coth u

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
1.700	0.42453	$\bar{4}5.4$	0.45153	$\bar{4}6.6$	0.027000	5.8	0.027000
.701	.42499		.45193		.027100		.027100
.702	.42545		.45234		.027197		.027198
.703	.42592		.45275		.027293		.027294
.704	.42639		.45315		.027388		.027389
1.705	0.42685	$\bar{4}5.4$	0.45356	$\bar{4}6.7$	0.027489	5.7	0.027491
.706	.42731		.45397		.027585		.027586
.707	.42778		.45437		.027681		.027682
.708	.42824		.45478		.027776		.027777
.709	.42871		.45519		.027872		.027873
1.710	0.42917	$\bar{4}5.4$	0.45559	$\bar{4}6.7$	0.027975	5.7	0.027974
.711	.42964		.45600		.028071		.028072
.712	.43010		.45641		.028166		.028167
.713	.43056		.45682		.028262		.028263
.714	.43102		.45722		.028357		.028358
1.715	0.43149	$\bar{4}5.3$	0.45763	$\bar{4}6.7$	0.028456	5.6	0.028454
.716	.43195		.45804		.028552		.028553
.717	.43241		.45844		.028647		.028648
.718	.43288		.45885		.028743		.028744
.719	.43334		.45926		.028838		.028839
1.720	0.43380	$\bar{4}5.3$	0.45966	$\bar{4}6.7$	0.028934	5.6	0.028931
.721	.43427		.46007		.029030		.029031
.722	.43473		.46048		.029125		.029126
.723	.43519		.46089		.029221		.029222
.724	.43565		.46129		.029316		.029317
1.725	0.43612	$\bar{4}5.3$	0.46170	$\bar{4}6.8$	0.029412	5.5	0.029408
.726	.43658		.46211		.029507		.029508
.727	.43704		.46252		.029603		.029604
.728	.43751		.46293		.029698		.029699
.729	.43797		.46333		.029794		.029795
1.730	0.43843	$\bar{4}5.2$	0.46374	$\bar{4}6.8$	0.029890	5.5	0.029886
.731	.43889		.46415		.029985		.029986
.732	.43936		.46456		.030081		.030082
.733	.43982		.46496		.030176		.030177
.734	.44028		.46537		.030272		.030273
1.735	0.44074	$\bar{4}5.2$	0.46578	$\bar{4}6.8$	0.030367	5.4	0.030363
.736	.44120		.46619		.030463		.030464
.737	.44167		.46660		.030558		.030559
.738	.44213		.46701		.030654		.030655
.739	.44259		.46741		.030750		.030751
1.740	0.44305	$\bar{4}5.2$	0.46782	$\bar{4}6.9$	0.030845	5.4	0.030841
.741	.44351		.46823		.030941		.030942
.742	.44398		.46864		.031036		.031037
.743	.44444		.46905		.031132		.031133
.744	.44490		.46945		.031227		.031228
1.745	0.44536	$\bar{4}5.2$	0.46986	$\bar{4}6.9$	0.031323	5.4	0.031319
.746	.44582		.47027		.031418		.031419
.747	.44628		.47067		.031514		.031515
.748	.44675		.47108		.031609		.031610
.749	.44721		.47149		.031705		.031706
1.750	0.44767	$\bar{4}5.1$	0.47190	$\bar{4}6.9$	0.031800	5.3	0.031796
u	$\log \tanh u$	$= F_1'$	$\log \coth u$	$= F_2'$	$\log \sinh u$	$= F_3'$	$\log \cosh u$

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

u	log sinh u	= F ₁ '	log cosh u	= F ₂ '	log tanh u	= F ₃ '	log coth u
1.750	0.11999	49.1	0.17191	49.9	0.09196	5.1	0.02121
.751	.11993		.17183		.09182	5.2	.02118
.752	.11989		.17172		.09169		.02113
.753	.11985		.17163		.09154		.02108
.754	.11978		.17154		.09140		.02103
1.755	0.11970	49.1	0.17145	49.9	0.09126	5.2	0.02098
.756	.11964		.17139		.09108		.02094
.757	.11958		.17127		.09093		.02089
.758	.11951		.17118		.09078		.02084
.759	.11945		.17109		.09063		.02079
1.760	0.11938	49.1	0.17101	49.9	0.09048	5.1	0.02074
.761	.11931		.17091		.09031		.02070
.762	.11924		.17082		.09016		.02065
.763	.11916		.17074		.09001		.02060
.764	.11912		.17063	49.9	.08986		.02055
1.765	0.11903	49.1	0.17054	49.9	0.08971	5.1	0.02050
.766	.11897		.17045		.08959		.02045
.767	.11890		.17036		.08944		.02040
.768	.11883		.17027		.08929		.02035
.769	.11877		.17018		.08914		.02030
1.770	0.11868	49.0	0.17009	49.9	0.08900	5.0	0.02025
.771	.11861		.16999		.08884		.02020
.772	.11854		.16991		.08869		.02015
.773	.11847		.16982		.08854		.02010
.774	.11840		.16973		.08839		.02005
1.775	0.11831	49.0	0.16964	49.9	0.08824	5.0	0.02000
.776	.11825		.16955		.08809		.01995
.777	.11818		.16946		.08794		.01990
.778	.11811		.16937		.08779		.01985
.779	.11804		.16928		.08764		.01980
1.780	0.11795	49.0	0.16919	49.9	0.08750	4.9	0.01975
.781	.11789		.16910		.08734		.01970
.782	.11782		.16901		.08719		.01965
.783	.11775		.16892		.08704		.01960
.784	.11768		.16883		.08689		.01955
1.785	0.11759	48.9	0.16874	49.1	0.08674	4.9	0.01950
.786	.11753		.16866		.08659		.01945
.787	.11746		.16857		.08644		.01940
.788	.11739		.16848		.08629		.01935
.789	.11732		.16839		.08614		.01930
1.790	0.11723	48.9	0.16830	49.1	0.08599	4.8	0.01925
.791	.11717		.16821		.08584		.01920
.792	.11710		.16812		.08569		.01915
.793	.11703		.16803		.08554		.01910
.794	.11696		.16794		.08539		.01905
1.795	0.11687	48.9	0.16785	49.1	0.08524	4.8	0.01900
.796	.11681		.16776		.08509		.01895
.797	.11674		.16767		.08494		.01890
.798	.11667		.16758		.08479		.01885
.799	.11660		.16749		.08464		.01880
1.800	0.11651	48.9	0.16740	49.1	0.08449	4.8	0.01875
u	log tanh u	= F ₁ '	log coth u	= F ₂ '	log sinh u	= F ₃ '	log cosh u

Logarithms of Hyperbolic Functions.

u	log sinh u	w = F ₁ '	log cosh u	w = F ₂ '	log tanh u	w = F ₃ '	log coth u
1.800	0.46997	45.0	0.46997	41.1	0.00000	4.0	0.00000
.801	.47013		.47013		.00001	4.0	.00001
.802	.47029		.47029		.00002		.00002
.803	.47044		.47044		.00003		.00003
.804	.47059	45.8	.47059		.00004		.00004
1.805	0.47076	45.8	0.47076	41.1	0.00005	4.0	0.00005
.806	.47112		.47112		.00006		.00006
.807	.47148		.47148		.00007		.00007
.808	.47184		.47184	41.2	.00008		.00008
.809	.47220		.47220		.00009		.00009
1.810	0.47255	45.8	0.47255	41.2	0.00010	4.0	0.00010
.811	.47271		.47271		.00011	4.0	.00011
.812	.47287		.47287		.00012		.00012
.813	.47303		.47303		.00013		.00013
.814	.47319		.47319		.00014		.00014
1.815	0.47354	45.8	0.47354	41.2	0.00015	4.0	0.00015
.816	.47370		.47370		.00016		.00016
.817	.47386		.47386		.00017		.00017
.818	.47402		.47402		.00018		.00018
.819	.47418		.47418		.00019		.00019
1.820	0.47453	45.8	0.47453	41.2	0.00020	4.0	0.00020
.821	.47469		.47469		.00021		.00021
.822	.47485		.47485		.00022		.00022
.823	.47501		.47501		.00023	4.5	.00023
.824	.47517		.47517		.00024		.00024
1.825	0.47552	45.7	0.47552	41.2	0.00025	4.5	0.00025
.826	.47568		.47568		.00026		.00026
.827	.47584		.47584		.00027		.00027
.828	.47600		.47600		.00028		.00028
.829	.47616		.47616		.00029		.00029
1.830	0.47651	45.7	0.47651	41.3	0.00030	4.5	0.00030
.831	.47667		.47667		.00031		.00031
.832	.47683		.47683		.00032		.00032
.833	.47699		.47699		.00033	4.5	.00033
.834	.47715		.47715		.00034		.00034
1.835	0.47750	45.7	0.47750	41.3	0.00035	4.4	0.00035
.836	.47766		.47766		.00036		.00036
.837	.47782		.47782		.00037		.00037
.838	.47798		.47798		.00038		.00038
.839	.47814		.47814		.00039		.00039
1.840	0.47849	45.7	0.47849	41.3	0.00040	4.4	0.00040
.841	.47865		.47865		.00041		.00041
.842	.47881		.47881		.00042		.00042
.843	.47897		.47897		.00043		.00043
.844	.47913		.47913		.00044		.00044
1.845	0.47948	45.7	0.47948	41.3	0.00045	4.3	0.00045
.846	.47964		.47964		.00046		.00046
.847	.47980	45.6	.47980		.00047		.00047
.848	.47996		.47996		.00048		.00048
.849	.48012		.48012		.00049		.00049
1.850	0.48047	45.6	0.48047	41.3	0.00050	4.3	0.00050
u	log tanh u	w = F ₁ '	log coth u	w = F ₂ '	log sinh u	w = F ₃ '	log cosh u

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
1.890	0.10151	45.0	0.51302	41.3	9.02852	4.3	0.02148
1.891	.10150		.51315		.02850		.02144
1.892	.10149		.51325		.02848		.02140
1.893	.10148		.51336		.02846		.02136
1.894	.10147		.51346	41.4	.02844		.02132
1.895	0.10138	45.1	0.51390	41.3	9.02873	4.3	0.02127
1.896	.10138		.51391		.02871		.02122
1.897	.10137		.51393		.02868	4.2	.02118
1.898	.10136		.51393		.02866		.02114
1.899	.10135		.51394		.02864		.02110
1.899	0.10130	45.0	0.51716	41.1	9.02865	4.2	0.02105
1.900	.10129		.51752		.02863		.02101
1.901	.10127		.51768		.02861		.02097
1.902	.10127		.51781		.02859		.02093
1.903	.10126		.51781		.02857		.02089
1.904	0.10125	45.0	0.51913	41.4	9.02916	4.2	0.02084
1.905	.10124		.51901		.02914		.02080
1.906	.10123		.51908		.02911		.02076
1.907	.10122		.51917		.02908		.02072
1.908	.10121		.51925		.02906	4.1	.02068
1.909	.10120	45.5	.51938		.02904		.02064
1.909	0.10106	45.5	0.52130	41.4	9.02936	4.1	0.02051
1.910	.10112		.52171		.02930		.02046
1.911	.10112		.52172		.02915		.02045
1.912	.10111		.52151		.02909		.02041
1.913	.10110		.52156		.02903		.02037
1.914	.10108		.52156		.02903		.02037
1.915	0.10101	45.5	0.52137	41.4	9.02927	4.1	0.02031
1.916	.10101		.52158		.02901		.02029
1.917	.10100		.52150		.02895		.02025
1.918	.10099		.52140		.02890		.02021
1.919	.10096		.52140		.02893		.02017
1.919	0.10101	45.5	0.52514	41.3	9.02977	4.0	0.02023
1.920	.10102		.52525		.02961		.02019
1.921	.10101		.52512		.02956		.02015
1.922	.10100		.52508		.02950		.02011
1.923	.10099		.52500		.02943		.02007
1.924	0.10091	45.5	0.52734	41.5	9.02997	4.0	0.02003
1.925	.10091		.52711		.02981		.01999
1.926	.10090		.52691		.02965		.01995
1.927	.10089		.52676		.02959		.01991
1.928	.10088		.52677		.02951		.01987
1.929	0.10080	45.5	0.52920	41.3	9.02997	4.0	0.01983
1.930	.10081		.52911		.02981		.01979
1.931	.10080		.52900		.02965		.01975
1.932	.10079		.52891		.02959		.01971
1.933	.10078		.52883		.02953	3.9	.01967
1.934	.10076		.52875		.02946		.01963
1.935	0.10073	45.1	0.53166	41.5	9.02997	3.9	0.01959
1.936	.10073		.53208		.02981		.01955
1.937	.10072		.53210		.02965		.01951
1.938	.10071		.53201		.02959		.01947
1.939	.10070		.53193		.02953		.01943
1.940	0.10140	45.1	0.53371	41.5	9.02807	3.9	0.01943
u	$\log \tanh u$	$= F_1'$	$\log \coth u$	$= F_2'$	$\log \sinh u$	$= F_3'$	$\log \cosh u$

Logarithms of Hyperbolic Functions.

u	log sinh u	= F ₁ '	log cosh u	= F ₂ '	log tanh u	= F ₃ '	log coth u	= F ₄ '
1.000	0.54400	45.4	0.54404	47.5	0.00000	4.0	0.00013	
.001	.54470		.54415		.00000		.00020	
.002	.54521		.54457		.00001		.00026	
.003	.54567		.54498		.00002		.00032	
.004	.54612		.54540		.00003		.00038	
1.005	0.54659	45.4	0.54584	47.5	0.00004	4.0	0.00044	
.006	.54703		.54625	47.6	.00005		.00050	
.007	.54748		.54665		.00006		.00056	
.008	.54794		.54706		.00007		.00062	
.009	.54839		.54748		.00008		.00068	
1.010	0.54885	45.4	0.54789	47.6	0.00009	4.0	0.00075	
.011	.54930		.54830		.00010		.00081	
.012	.54975		.54872		.00011		.00087	
.013	.55020		.54914		.00012		.00093	
.014	.55066		.54956		.00013		.00099	
1.015	0.55111	45.4	0.54997	47.6	0.00014	4.0	0.00106	
.016	.55157		.55039		.00015		.00112	
.017	.55202	45.3	.55080		.00016		.00118	
.018	.55247		.55122		.00017		.00125	
.019	.55293		.55164		.00018	3.7	.00131	
1.020	0.55338	45.3	0.55205	47.6	0.00019	3.7	0.00138	
.021	.55384		.55247		.00020		.00144	
.022	.55429		.55289		.00021		.00150	
.023	.55475		.55330		.00022		.00156	
.024	.55520		.55372		.00023		.00162	
1.025	0.55565	45.3	0.55413	47.6	0.00024	3.7	0.00169	
.026	.55610		.55455		.00025		.00175	
.027	.55655		.55497		.00026		.00181	
.028	.55700		.55538		.00027		.00187	
.029	.55746		.55580		.00028		.00193	
1.030	0.55791	45.3	0.55621	47.6	0.00029	3.7	0.00200	
.031	.55836		.55663		.00030		.00206	
.032	.55881		.55705		.00031		.00212	
.033	.55927		.55746		.00032	3.6	.00218	
.034	.55972		.55788	47.7	.00033		.00224	
1.035	0.56018	45.3	0.55830	47.7	0.00034	3.6	0.00231	
.036	.56064		.55871		.00035		.00237	
.037	.56109		.55913		.00036		.00243	
.038	.56155		.55955		.00037		.00249	
.039	.56200		.55997		.00038		.00255	
1.040	0.56244	45.3	0.56038	47.7	0.00039	3.6	0.00262	
.041	.56289		.56080		.00040		.00268	
.042	.56334		.56121		.00041		.00274	
.043	.56379	45.2	.56163		.00042		.00280	
.044	.56425		.56205		.00043		.00286	
1.045	0.56470	45.2	0.56246	47.7	0.00044	3.6	0.00293	
.046	.56515		.56288		.00045	3.5	.00299	
.047	.56561		.56330		.00046		.00305	
.048	.56606		.56371		.00047		.00311	
.049	.56651		.56413		.00048		.00317	
1.050	0.56696	45.2	0.56455	47.7	0.00049	3.5	0.00324	
u	log tanh u	= F ₁ '	log coth u	= F ₂ '	log sinh u	= F ₃ '	log cosh u	= F ₄ '

SMITHSONIAN TABLES

Logarithm of Hyperbolic Functions.

u	$\log \sinh u$	$= F_2'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_2'$	$\log \coth u$
1.000	0.53966	45.2	0.55155	41.7	0.08112	3.5	0.017298
.050	.53742		.55040		.08115		.01755
.100	.53517		.54924		.08119		.01781
.150	.53292		.54808		.08122		.01806
.200	.53067		.54692		.08126		.01831
1.050	0.53022	45.2	0.53943	41.7	0.08129	3.5	0.01741
.050	.53004		.53705		.08131		.01737
.100	.52986		.53467		.08133		.01733
.150	.52968		.53229		.08135		.01729
.200	.52950		.52991		.08137		.01725
1.100	0.52898	45.2	0.52879	41.7	0.08139	3.4	0.01721
.050	.52891		.52884		.08140		.01720
.100	.52884		.52877		.08141		.01717
.150	.52877		.52870		.08142		.01714
.200	.52870		.52863		.08143		.01710
1.150	0.52874	45.2	0.52863	41.3	0.08144	3.4	0.01706
.050	.52874		.52863		.08145		.01703
.100	.52874		.52863		.08146		.01700
.150	.52874		.52863		.08147		.01696
.200	.52874		.52863		.08148		.01693
1.200	0.52860	45.2	0.52860	41.3	0.08149	3.4	0.01689
.050	.52855	45.1	.52855		.08151		.01686
.100	.52850		.52850		.08152		.01683
.150	.52845		.52845		.08153		.01680
.200	.52840		.52840		.08154		.01676
1.250	0.52835	45.1	0.52835	41.3	0.08155	3.3	0.01673
.050	.52831		.52831		.08156		.01669
.100	.52827		.52827		.08157		.01666
.150	.52823		.52823		.08158		.01663
.200	.52819		.52819		.08159		.01660
1.300	0.52815	45.1	0.52815	41.3	0.08160	3.3	0.01656
.050	.52812		.52812		.08161		.01653
.100	.52809		.52809		.08162		.01650
.150	.52806		.52806		.08163		.01646
.200	.52803		.52803		.08164		.01643
1.350	0.52800	45.1	0.52800	41.3	0.08165	3.3	0.01640
.050	.52797		.52797		.08166		.01636
.100	.52794		.52794		.08167		.01633
.150	.52791		.52791		.08168		.01630
.200	.52788		.52788		.08169		.01626
1.400	0.52785	45.1	0.52785	41.3	0.08170	3.2	0.01623
.050	.52782		.52782		.08171		.01620
.100	.52779		.52779		.08172		.01617
.150	.52776		.52776		.08173		.01614
.200	.52773		.52773		.08174		.01610
1.450	0.52770	45.1	0.52770	41.0	0.08175	3.2	0.01607
.050	.52767		.52767		.08176		.01604
.100	.52764		.52764		.08177		.01601
.150	.52761		.52761		.08178		.01597
.200	.52758		.52758		.08179		.01594
2.000	0.52953	45.0	0.52954	41.0	0.08180	3.2	0.01591
u	$\log \tanh u$	$= F_2'$	$\log \coth u$	$= F_2'$	$\log \sinh u$	$= F_2'$	$\log \cosh u$

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$u F_1'$	$\log \cosh u$	$u F_2'$	$\log \tanh u$	$u F_3'$	$\log \coth u$
2.050	0.58202	44.0	0.59611	42.0	0.98860	2.0	0.01410
.051	.58246		.59683		.98913		.01437
.052	.58291		.59725		.98966		.01464
.053	.58336		.59767		.99019		.01491
.054	.58381		.59809		.99072		.01518
2.055	0.58426	44.0	0.59851	42.0	0.99125	2.0	0.01545
.056	.58471		.59903		.99178		.01572
.057	.58516		.59935		.99230		.01599
.058	.58561		.59977		.99283		.01626
.059	.58606		.60019		.99336		.01653
2.060	0.58650	44.0	0.60061	42.0	0.99389	2.0	0.01680
.061	.58695		.60103		.99442		.01707
.062	.58740		.60146		.99495		.01734
.063	.58785		.60188		.99547		.01761
.064	.58830		.60230	42.1	.99600		.01788
2.065	0.58875	44.8	0.60272	42.1	0.99653	2.8	0.01815
.066	.58920		.60314		.99706		.01842
.067	.58964		.60356		.99759		.01869
.068	.59009		.60398		.99811		.01896
.069	.59054		.60440		.99864		.01923
2.070	0.59099	44.8	0.60482	42.1	0.99917	2.8	0.01950
.071	.59144		.60524		.99970		.01977
.072	.59189		.60566		.99922		.02004
.073	.59233		.60608		.99975		.02031
.074	.59278		.60650		.99928	2.7	.02058
2.075	0.59323	44.8	0.60692	42.1	0.99981	2.7	0.02085
.076	.59368		.60734		.99933		.02112
.077	.59413		.60777		.99986		.02139
.078	.59457		.60819		.99939		.02166
.079	.59502		.60861		.99992		.02193
2.080	0.59547	44.8	0.60903	42.1	0.99944	2.7	0.02220
.081	.59592		.60945		.99997		.02247
.082	.59637		.60987		.99950		.02274
.083	.59681		.61029		.99902		.02301
.084	.59726		.61071		.99955		.02328
2.085	0.59771	44.8	0.61113	42.1	0.99908	2.7	0.02355
.086	.59816		.61155		.99960		.02382
.087	.59861		.61198		.99913		.02409
.088	.59905		.61240		.99966		.02436
.089	.59950		.61282		.99918		.02463
2.090	0.59995	44.8	0.61324	42.1	0.99971	2.7	0.02490
.091	.60040		.61366		.99924		.02517
.092	.60083		.61408		.99976	2.6	.02544
.093	.60128		.61450		.99929		.02571
.094	.60174		.61492		.99982		.02598
2.095	0.60219	44.8	0.61535	42.1	0.99934	2.6	0.02625
.096	.60264		.61577		.99987		.02652
.097	.60308		.61619		.99940		.02679
.098	.60353		.61661		.99992		.02706
.099	.60398		.61703		.99945		.02733
2.100	0.60443	44.8	0.61745	42.1	0.99997	2.6	0.02760
u	$\log \tan gd u$	$u F_1'$	$\log \sec gd u$	$u F_2'$	$\log \sin gd u$	$u F_3'$	$\log \csc gd u$

Logarithms of Hyperbolic Functions.

u	log sinh u	= F ₁ '	log cosh u	= F ₂ '	log tanh u	= F ₃ '	log coth u
2.100	0.60143	44.8	0.61745	44.1	0.08407	2.0	0.01901
.101	.60187	44.7	.61787		.08450		.01900
.102	.60232		.61830	44.0	.08493		.01897
.103	.60277		.61872		.08535		.01895
.104	.60322		.61914		.08578		.01892
2.105	0.60366	44.7	0.61956	43.9	0.08620	2.0	0.01890
.106	.60411		.61998		.08663		.01887
.107	.60456		.62040		.08705		.01884
.108	.60501		.62081		.08748		.01882
.109	.60545		.62125		.08791		.01879
2.110	0.60589	44.7	0.62167	43.8	0.08833	2.0	0.01877
.111	.60633		.62209		.08876	2.5	.01874
.112	.60678		.62251		.08918		.01872
.113	.60722		.62293		.08961		.01869
.114	.60766		.62335		.09003		.01867
2.115	0.61114	44.7	0.62378	43.7	0.09046	2.5	0.01864
.116	.61158		.62420		.09088		.01862
.117	.61203		.62462		.09131		.01859
.118	.61248		.62504		.09173		.01857
.119	.61292		.62546		.09216		.01854
2.120	0.61337	44.7	0.62589	43.6	0.09258	2.5	0.01852
.121	.61381		.62631		.09301		.01849
.122	.61427		.62673		.09343		.01847
.123	.61471		.62715		.09386		.01844
.124	.61516		.62757		.09428		.01842
2.125	0.61561	44.7	0.62800	43.5	0.09470	2.5	0.01839
.126	.61605		.62842		.09513		.01837
.127	.61650		.62884		.09555		.01834
.128	.61695		.62926		.09598		.01832
.129	.61739		.62969		.09640		.01829
2.130	0.61784	44.7	0.63011	43.4	0.09683	2.5	0.01827
.131	.61828		.63053		.09725	2.4	.01824
.132	.61873		.63095		.09768		.01822
.133	.61918		.63137		.09810		.01819
.134	.61963		.63179		.09853		.01817
2.135	0.62007	44.7	0.63222	43.3	0.09895	2.4	0.01815
.136	.62052		.63264		.09938		.01812
.137	.62097		.63306		.09980		.01810
.138	.62141		.63349		.10023		.01807
.139	.62185		.63391		.10065		.01805
2.140	0.62231	44.6	0.63433	43.2	0.09998	2.4	0.01802
.141	.62275		.63475		.10040		.01800
.142	.62320		.63518		.10082		.01798
.143	.62365		.63560	43.1	.10125		.01795
.144	.62409		.63602		.10167		.01793
2.145	0.62454	44.6	0.63644	43.1	0.09800	2.4	0.01790
.146	.62498		.63687		.10042		.01788
.147	.62543		.63729		.10084		.01786
.148	.62588		.63771		.10127		.01783
.149	.62632		.63813		.10169		.01781
2.150	0.62677	44.6	0.63855	43.0	0.09882	2.4	0.01779
u	log tanh u	= F ₁ '	log sec gd u	= F ₂ '	log sin gd u	= F ₃ '	log cos gd u

BRITISH TABLES

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$\propto F_2'$	$\log \cosh u$	$\propto F_2'$	$\log \tanh u$	$\propto F_2'$	$\log \coth u$
2.150	0.60677	44.6	0.60895	42.3	9.98821	2.4	0.01179
.151	.60722		.60940		.98824		.01176
.152	.60766		.60984		.98826		.01174
.153	.60811		.61028		.98828		.01172
.154	.60855		.61073		.98831		.01169
2.155	0.60900	44.6	0.61017	42.3	9.98833	2.4	0.01167
.156	.60945		.61062		.98835		.01165
.157	.60989		.61107		.98838		.01162
.158	.61034		.61152		.98840		.01160
.159	.61079		.61197		.98842		.01158
2.160	0.61123	44.6	0.61248	42.3	9.98845	2.4	0.01155
.161	.61168		.61293		.98847		.01153
.162	.61212		.61338		.98849		.01151
.163	.61257		.61383		.98852		.01148
.164	.61302		.61428		.98854		.01146
2.165	0.61346	44.6	0.61472	42.3	9.98856	2.4	0.01144
.166	.61391		.61517		.98859		.01141
.167	.61435		.61562		.98861		.01139
.168	.61480		.61607		.98863		.01137
.169	.61524		.61652		.98865		.01135
2.170	0.61569	44.6	0.61697	42.3	9.98868	2.4	0.01132
.171	.61614		.61742		.98870		.01130
.172	.61658		.61787		.98872		.01128
.173	.61703		.61832		.98874		.01126
.174	.61747		.61877		.98877	2.4	.01123
2.175	0.61792	44.6	0.61913	42.3	9.98879	2.4	0.01121
.176	.61836		.61958		.98881		.01119
.177	.61881		.62003		.98883		.01117
.178	.61925		.62048		.98886		.01114
.179	.61970		.62092		.98888		.01112
2.180	0.62015	44.6	0.62133	42.3	9.98890	2.4	0.01110
.181	.62059		.62178		.98892		.01108
.182	.62104		.62223		.98894		.01106
.183	.62148		.62268		.98897		.01103
.184	.62193		.62312		.98899		.01101
2.185	0.62237	44.5	0.62356	42.3	9.98901	2.4	0.01099
.186	.62282		.62401		.98903		.01097
.187	.62326		.62446		.98905		.01095
.188	.62371		.62491		.98908		.01092
.189	.62416		.62536		.98910		.01090
2.190	0.62460	44.5	0.62548	42.4	9.98912	2.4	0.01088
.191	.62505		.62593		.98914		.01086
.192	.62549		.62638		.98916		.01084
.193	.62594		.62683		.98919		.01081
.194	.62638		.62728		.98921		.01079
2.195	0.62683	44.5	0.62760	42.4	9.98923	2.4	0.01077
.196	.62727		.62802		.98925		.01075
.197	.62772		.62847		.98927		.01073
.198	.62816		.62892		.98929		.01071
.199	.62861		.62937		.98931		.01069
2.200	0.62905	44.5	0.62972	42.4	9.98934	2.4	0.01066
u	$\log \tanh u$	$\propto F_2'$	$\log \coth u$	$\propto F_2'$	$\log \sinh u$	$\propto F_2'$	$\log \cosh u$

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	u/F'	$\log \cosh u$	u/F'	$\log \tanh u$	u/F'	$\log \coth u$
2.200	0.66905	44.5	0.66972	44.4	0.00067	4.1	0.00066
2.201	0.66910		0.66977		0.00068		0.00067
2.202	0.66915		0.66982		0.00069		0.00068
2.203	0.66920		0.66987		0.00070		0.00069
2.204	0.66925		0.66992		0.00071		0.00070
2.205	0.66930	44.5	0.66997	44.4	0.00072	4.1	0.00071
2.206	0.66935		0.67002		0.00073		0.00072
2.207	0.66940		0.67007		0.00074		0.00073
2.208	0.66945		0.67012		0.00075		0.00074
2.209	0.66950		0.67017		0.00076		0.00075
2.210	0.66955	44.5	0.67022	44.4	0.00077	4.1	0.00076
2.211	0.66960		0.67027		0.00078		0.00077
2.212	0.66965		0.67032		0.00079		0.00078
2.213	0.66970		0.67037		0.00080		0.00079
2.214	0.66975		0.67042		0.00081		0.00080
2.215	0.66980	44.5	0.67047	44.4	0.00082	4.1	0.00081
2.216	0.66985		0.67052		0.00083		0.00082
2.217	0.66990		0.67057		0.00084		0.00083
2.218	0.66995		0.67062		0.00085		0.00084
2.219	0.66999		0.67067		0.00086		0.00085
2.220	0.67004	44.5	0.67072	44.4	0.00087	4.1	0.00086
2.221	0.67009		0.67077		0.00088		0.00087
2.222	0.67014		0.67082		0.00089		0.00088
2.223	0.67019		0.67087		0.00090		0.00089
2.224	0.67024		0.67092		0.00091		0.00090
2.225	0.67029	44.5	0.67097	44.4	0.00092	4.1	0.00091
2.226	0.67034		0.67102		0.00093		0.00092
2.227	0.67039		0.67107		0.00094		0.00093
2.228	0.67044		0.67112		0.00095		0.00094
2.229	0.67049	44.5	0.67117	44.4	0.00096	4.1	0.00095
2.230	0.67054		0.67122		0.00097		0.00096
2.231	0.67059		0.67127		0.00098		0.00097
2.232	0.67064		0.67132		0.00099		0.00098
2.233	0.67069		0.67137		0.00100		0.00099
2.234	0.67074	44.5	0.67142	44.4	0.00101	4.1	0.00100
2.235	0.67079		0.67147		0.00102		0.00101
2.236	0.67084		0.67152		0.00103		0.00102
2.237	0.67089		0.67157		0.00104		0.00103
2.238	0.67094		0.67162		0.00105		0.00104
2.239	0.67099	44.5	0.67167	44.4	0.00106	4.1	0.00105
2.240	0.67104		0.67172		0.00107		0.00106
2.241	0.67109		0.67177		0.00108		0.00107
2.242	0.67114		0.67182		0.00109		0.00108
2.243	0.67119		0.67187		0.00110		0.00109
2.244	0.67124	44.5	0.67192	44.4	0.00111	4.1	0.00110
2.245	0.67129		0.67197		0.00112		0.00111
2.246	0.67134		0.67202		0.00113		0.00112
2.247	0.67139		0.67207		0.00114		0.00113
2.248	0.67144		0.67212		0.00115		0.00114
2.249	0.67149	44.5	0.67217	44.4	0.00116	4.1	0.00115
2.250	0.67154		0.67222		0.00117		0.00116
2.251	0.67159		0.67227		0.00118		0.00117
2.252	0.67164		0.67232		0.00119		0.00118
2.253	0.67169		0.67237		0.00120		0.00119
2.254	0.67174	44.5	0.67242	44.4	0.00121	4.1	0.00120
2.255	0.67179		0.67247		0.00122		0.00121
2.256	0.67184		0.67252		0.00123		0.00122
2.257	0.67189		0.67257		0.00124		0.00123
2.258	0.67194		0.67262		0.00125		0.00124
2.259	0.67199	44.5	0.67267	44.4	0.00126	4.1	0.00125
2.260	0.67204		0.67272		0.00127		0.00126
2.261	0.67209		0.67277		0.00128		0.00127
2.262	0.67214		0.67282		0.00129		0.00128
2.263	0.67219		0.67287		0.00130		0.00129
2.264	0.67224	44.5	0.67292	44.4	0.00131	4.1	0.00130
2.265	0.67229		0.67297		0.00132		0.00131
2.266	0.67234		0.67302		0.00133		0.00132
2.267	0.67239		0.67307		0.00134		0.00133
2.268	0.67244		0.67312		0.00135		0.00134
2.269	0.67249	44.5	0.67317	44.4	0.00136	4.1	0.00135
2.270	0.67254		0.67322		0.00137		0.00136
2.271	0.67259		0.67327		0.00138		0.00137
2.272	0.67264		0.67332		0.00139		0.00138
2.273	0.67269		0.67337		0.00140		0.00139
2.274	0.67274	44.5	0.67342	44.4	0.00141	4.1	0.00140
2.275	0.67279		0.67347		0.00142		0.00141
2.276	0.67284		0.67352		0.00143		0.00142
2.277	0.67289		0.67357		0.00144		0.00143
2.278	0.67294		0.67362		0.00145		0.00144
2.279	0.67299	44.5	0.67367	44.4	0.00146	4.1	0.00145
2.280	0.67304		0.67372		0.00147		0.00146
2.281	0.67309		0.67377		0.00148		0.00147
2.282	0.67314		0.67382		0.00149		0.00148
2.283	0.67319		0.67387		0.00150		0.00149
2.284	0.67324	44.5	0.67392	44.4	0.00151	4.1	0.00150
2.285	0.67329		0.67397		0.00152		0.00151
2.286	0.67334		0.67402		0.00153		0.00152
2.287	0.67339		0.67407		0.00154		0.00153
2.288	0.67344		0.67412		0.00155		0.00154
2.289	0.67349	44.5	0.67417	44.4	0.00156	4.1	0.00155
2.290	0.67354		0.67422		0.00157		0.00156
2.291	0.67359		0.67427		0.00158		0.00157
2.292	0.67364		0.67432		0.00159		0.00158
2.293	0.67369		0.67437		0.00160		0.00159
2.294	0.67374	44.5	0.67442	44.4	0.00161	4.1	0.00160
2.295	0.67379		0.67447		0.00162		0.00161
2.296	0.67384		0.67452		0.00163		0.00162
2.297	0.67389		0.67457		0.00164		0.00163
2.298	0.67394		0.67462		0.00165		0.00164
2.299	0.67399	44.5	0.67467	44.4	0.00166	4.1	0.00165
2.300	0.67404		0.67472		0.00167		0.00166

Logarithms of Hyperbolic Functions.

u	log sinh u	= F ₁ '	log cosh u	= F ₂ '	log tanh u	= F ₃ '	log coth u
2.250	0.67128	44.4	0.68003	42.5	9.99935	1.0	0.00065
.251	.67173		.68131		.99937		.00063
.252	.67217		.68178		.99939		.00061
.253	.67261		.68220		.99941		.00059
.254	.67306		.68263		.99943		.00057
2.255	0.67350	44.4	0.68305	42.5	9.99945	1.0	0.00055
.256	.67394		.68348		.99947		.00053
.257	.67439		.68390		.99948		.00052
.258	.67483		.68433		.99950		.00050
.259	.67528		.68475		.99952		.00048
2.260	0.67572	44.4	0.68518	42.5	9.99954	1.0	0.00046
.261	.67616		.68560		.99956		.00044
.262	.67661		.68603		.99958		.00042
.263	.67705		.68645		.99960		.00040
.264	.67750		.68688		.99962		.00038
2.265	0.67794	44.4	0.68730	42.5	9.99964	1.0	0.00036
.266	.67838		.68773		.99966		.00035
.267	.67883		.68815		.99969		.00033
.268	.67927		.68858		.99969		.00031
.269	.67971		.68900		.99971		.00029
2.270	0.68016	44.4	0.68943	42.5	9.99973	1.0	0.00027
.271	.68060		.68985		.99975		.00025
.272	.68105		.69028		.99977	1.8	.00023
.273	.68149		.69070		.99978		.00022
.274	.68193		.69113		.99980		.00020
2.275	0.68238	44.4	0.69156	42.5	9.99982	1.8	0.00018
.276	.68282		.69198		.99984		.00016
.277	.68326		.69241		.99986		.00014
.278	.68371		.69283		.99988		.00012
.279	.68415	44.3	.69326		.99989		.00011
2.280	0.68459	44.3	0.69368	42.5	9.99991	1.8	0.00000
.281	.68504		.69411		.99993		.00007
.282	.68548		.69453		.99995		.00005
.283	.68592		.69496		.99997		.00003
.284	.68637		.69538		.99998		.00002
2.285	0.68681	44.3	0.69581	42.5	9.99999	1.8	0.00000
.286	.68725		.69623		.99999		.00008
.287	.68770		.69666		.99999		.00006
.288	.68814		.69708		.99999		.00004
.289	.68858		.69751		.99999		.00003
2.290	0.68903	44.3	0.69794	42.5	9.99999	1.8	0.00001
.291	.68947		.69836		.99999		.00000
.292	.68991		.69879	42.6	.99999		.00007
.293	.69036		.69921		.99999		.00005
.294	.69080		.69964		.99999		.00004
2.295	0.69124	44.3	0.70006	42.6	9.99999	1.8	0.00002
.296	.69169		.70049		.99999		.00000
.297	.69213		.70091		.99999		.00007
.298	.69257		.70134		.99999		.00005
.299	.69302		.70177		.99999	1.7	.00003
2.300	0.69346	44.3	0.70219	42.6	9.99999	1.7	0.00001
u	log tanh u	= F ₁ '	log coth u	= F ₂ '	log sin u	= F ₃ '	log sec u

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
2.300	0.65336	44.3	0.70110	44.5	0.04774	1.7	0.00074
.301	.65339		.70112		.04774		.00074
.302	.65343		.70114		.04774		.00074
.303	.65347		.70117		.04774		.00074
.304	.65353		.70119		.04774		.00074
2.305	0.65358	44.3	0.70121	44.5	0.04774	1.7	0.00074
.306	.65362		.70123		.04774		.00074
.307	.65366		.70125		.04774		.00074
.308	.65370		.70128		.04774		.00074
.309	.65375		.70130		.04774		.00074
2.310	0.65379	44.3	0.70135	44.5	0.04774	1.7	0.00074
.311	.65383		.70137		.04774		.00074
.312	.65386		.70139		.04774		.00074
.313	.65391		.70141		.04774		.00074
.314	.65396		.70143		.04774		.00074
2.315	0.70100	44.3	0.70145	44.5	0.04774	1.7	0.00074
.316	.70105		.70147		.04774		.00074
.317	.70109		.70149		.04774		.00074
.318	.70113		.70151		.04774		.00074
.319	.70118		.70153		.04774		.00074
2.320	0.70122	44.3	0.70157	44.5	0.04774	1.7	0.00074
.321	.70126		.70159		.04774		.00074
.322	.70130		.70161		.04774		.00074
.323	.70135		.70163		.04774		.00074
.324	.70139		.70165		.04774		.00074
2.325	0.70143	44.3	0.70169	44.5	0.04774	1.7	0.00074
.326	.70147		.70171		.04774		.00074
.327	.70152		.70173		.04774		.00074
.328	.70156		.70175		.04774		.00074
.329	.70160		.70177		.04774		.00074
2.330	0.70165	44.3	0.70181	44.5	0.04774	1.7	0.00074
.331	.70169		.70183		.04774		.00074
.332	.70173		.70185		.04774		.00074
.333	.70177		.70187		.04774		.00074
.334	.70182		.70189		.04774		.00074
2.335	0.70186	44.3	0.70193	44.5	0.04774	1.7	0.00074
.336	.70190		.70195		.04774		.00074
.337	.70194		.70197		.04774		.00074
.338	.70198		.70199		.04774		.00074
.339	.70203		.70201		.04774		.00074
2.340	0.70207	44.3	0.70205	44.5	0.04774	1.7	0.00074
.341	.70211		.70207		.04774		.00074
.342	.70215		.70209		.04774		.00074
.343	.70219		.70211		.04774		.00074
.344	.70224		.70213		.04774		.00074
2.345	0.70228	44.3	0.70217	44.5	0.04774	1.7	0.00074
.346	.70232		.70219		.04774		.00074
.347	.70236		.70221		.04774		.00074
.348	.70240		.70223		.04774		.00074
.349	.70245		.70225		.04774		.00074
2.350	0.70249	44.3	0.70229	44.5	0.04774	1.7	0.00074
u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$\equiv F'_1$	$\log \cosh u$	$\equiv F'_2$	$\log \tanh u$	$\equiv F'_3$	$\log \coth u$
2.350	0.71550	44.2	0.72340	42.6	0.00210	1.6	0.00790
.351	.71644		.72392		.00212		.00788
.352	.71698		.72435		.00213		.00787
.353	.71692		.72477	42.7	.00215		.00785
.354	.71736		.72520		.00216		.00784
2.355	0.71781	44.2	0.72563	42.7	0.00218	1.6	0.00782
.356	.71825		.72605		.00219		.00781
.357	.71869		.72648		.00221		.00779
.358	.71913		.72691		.00223		.00777
.359	.71957		.72733		.00224		.00776
2.360	0.72002	44.2	0.72776	42.7	0.00226	1.5	0.00774
.361	.72046		.72819		.00227		.00773
.362	.72090		.72861		.00229		.00771
.363	.72134		.72904		.00230		.00770
.364	.72178		.72947		.00232		.00768
2.365	0.72223	44.2	0.72989	42.7	0.00233	1.5	0.00767
.366	.72267		.73032		.00235		.00765
.367	.72311		.73075		.00236		.00764
.368	.72355		.73117		.00238		.00762
.369	.72399		.73160		.00239		.00761
2.370	0.72444	44.2	0.73203	42.7	0.00241	1.5	0.00759
.371	.72488		.73245		.00242		.00758
.372	.72532		.73288		.00244		.00756
.373	.72576		.73331		.00245		.00755
.374	.72620		.73373		.00247		.00753
2.375	0.72665	44.2	0.73416	42.7	0.00249	1.5	0.00751
.376	.72709		.73459		.00250		.00750
.377	.72753		.73501		.00252		.00748
.378	.72797		.73544		.00253		.00747
.379	.72841		.73587		.00254		.00746
2.380	0.72885	44.2	0.73630	42.7	0.00256	1.5	0.00744
.381	.72929		.73672		.00257		.00743
.382	.72973		.73715		.00259		.00741
.383	.73018		.73758		.00260		.00740
.384	.73062		.73800		.00262		.00738
2.385	0.73106	44.2	0.73843	42.7	0.00263	1.5	0.00737
.386	.73151		.73886		.00265		.00735
.387	.73195		.73928		.00266		.00734
.388	.73239		.73971		.00268		.00732
.389	.73283		.74014		.00269		.00731
2.390	0.73327	44.2	0.74056	42.7	0.00271	1.5	0.00729
.391	.73371		.74099		.00272		.00728
.392	.73416		.74142		.00274		.00726
.393	.73460		.74185		.00275	1.4	.00725
.394	.73504		.74227		.00277		.00723
2.395	0.73548	44.2	0.74270	42.7	0.00278	1.4	0.00722
.396	.73592		.74313		.00279		.00721
.397	.73636		.74355		.00281		.00719
.398	.73680		.74398		.00282		.00718
.399	.73725		.74441		.00284		.00716
2.400	0.73769	44.2	0.74484	42.7	0.00285	1.4	0.00715
u	$\log \sinh u$	$\equiv F'_1$	$\log \cosh u$	$\equiv F'_2$	$\log \tanh u$	$\equiv F'_3$	$\log \coth u$

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$w = F_1'$	$\log \cosh u$	$w = F_1'$	$\log \tanh u$	$w = F_1'$	$\log \coth u$
2.400	0.73769	44.2	0.74484	42.7	9.99285	1.4	0.00715
.401	.73813	44.1	.74526		.99287		.00713
.402	.73857		.74569		.99288		.00712
.403	.73901		.74612		.99289		.00711
.404	.73945		.74655		.99291		.00709
2.405	0.73990	44.1	0.74699	42.7	9.99292	1.4	0.00708
.406	.74034		.74740		.99294		.00706
.407	.74078		.74783		.99295		.00705
.408	.74122		.74825		.99297		.00703
.409	.74166		.74868		.99298		.00702
2.410	0.74210	44.1	0.74911	42.7	9.99299	1.4	0.00701
.411	.74254		.74954		.99301		.00699
.412	.74298		.74996		.99302		.00698
.413	.74342		.75039		.99304		.00696
.414	.74386		.75082		.99305		.00695
2.415	0.74431	44.1	0.75125	42.7	9.99306	1.4	0.00694
.416	.74475		.75167		.99308		.00692
.417	.74519		.75210		.99309		.00691
.418	.74563		.75253		.99310		.00690
.419	.74607		.75296		.99312		.00688
2.420	0.74652	44.1	0.75338	42.7	9.99313	1.4	0.00687
.421	.74696		.75381		.99315		.00685
.422	.74740		.75424	42.8	.99316		.00684
.423	.74784		.75467		.99317		.00683
.424	.74828		.75509		.99319		.00681
2.425	0.74872	44.1	0.75552	42.8	9.99320	1.4	0.00680
.426	.74916		.75595		.99321		.00679
.427	.74960		.75638		.99323		.00677
.428	.75004		.75680		.99324		.00676
.429	.75048		.75723		.99325	1.3	.00675
2.430	0.75093	44.1	0.75766	42.8	9.99327	1.3	0.00673
.431	.75137		.75809		.99328		.00672
.432	.75181		.75851		.99329		.00671
.433	.75225		.75894		.99331		.00669
.434	.75269		.75937		.99332		.00668
2.435	0.75313	44.1	0.75980	42.8	9.99333	1.3	0.00667
.436	.75357		.76022		.99335		.00665
.437	.75401		.76065		.99336		.00664
.438	.75445		.76108		.99337		.00663
.439	.75490		.76151		.99339		.00661
2.440	0.75534	44.1	0.76194	42.8	9.99340	1.3	0.00660
.441	.75578		.76236		.99341		.00659
.442	.75622		.76279		.99343		.00657
.443	.75666		.76322		.99344		.00656
.444	.75710		.76365		.99345		.00655
2.445	0.75754	44.1	0.76407	42.8	9.99347	1.3	0.00653
.446	.75798		.76450		.99348		.00652
.447	.75842		.76493		.99349		.00651
.448	.75886		.76536		.99351		.00649
.449	.75930		.76579		.99352		.00648
2.450	0.75975	44.1	0.76621	42.8	9.99353	1.3	0.00647
u	$\log \tanh u$	$w = F_1'$	$\log \operatorname{sech} u$	$w = F_1'$	$\log \sin gd u$	$w = F_1'$	$\log \csc gd u$

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

u	log sinh u	= F ₁ '	log cosh u	= F ₂ '	log tanh u	= F ₃ '	log coth u
2.490	0.75675	44.1	0.76621	42.8	0.00353	1.3	0.00047
.451	.76019		.76664		.00354		.00046
.452	.76063		.76707		.00355		.00044
.453	.76107		.76750		.00356		.00043
.454	.76151		.76793		.00358		.00042
2.455	0.76195	44.1	0.76835	42.8	0.00360	1.3	0.00040
.456	.76239		.76878		.00361		.00039
.457	.76283		.76921		.00362		.00038
.458	.76327		.76964		.00363		.00037
.459	.76371		.77006		.00365		.00035
2.460	0.76415	44.1	0.77049	42.8	0.00366	1.3	0.00034
.461	.76459		.77092		.00367		.00033
.462	.76503		.77135		.00369		.00031
.463	.76547		.77178		.00370		.00030
.464	.76591		.77220		.00371		.00029
2.465	0.76635	44.1	0.77263	42.8	0.00372	1.3	0.00028
.466	.76679		.77306		.00374		.00026
.467	.76723		.77349		.00375		.00025
.468	.76767		.77392		.00376	1.2	.00024
.469	.76811		.77435		.00377		.00023
2.470	0.76855	44.1	0.77477	42.8	0.00379	1.2	0.00021
.471	.76900		.77520		.00380		.00020
.472	.76944		.77563		.00381		.00019
.473	.76988		.77606		.00382		.00018
.474	.77032		.77649		.00384		.00016
2.475	0.77076	44.0	0.77691	42.8	0.00385	1.2	0.00015
.476	.77120		.77734		.00386		.00014
.477	.77164		.77777		.00387		.00013
.478	.77208		.77820		.00388		.00012
.479	.77252		.77863		.00390		.00010
2.480	0.77296	44.0	0.77905	42.8	0.00391	1.2	0.00009
.481	.77340		.77948		.00392		.00008
.482	.77384		.77991		.00393		.00007
.483	.77428		.78034		.00394		.00006
.484	.77472		.78077		.00395		.00004
2.485	0.77517	44.0	0.78120	42.8	0.00397	1.2	0.00003
.486	.77561		.78163		.00398		.00002
.487	.77605		.78205		.00399		.00001
.488	.77649		.78248		.00401		.00000
.489	.77693		.78291		.00402		.00000
2.490	0.77737	44.0	0.78334	42.8	0.00403	1.2	0.00000
.491	.77781		.78377		.00404		.00000
.492	.77825		.78420		.00405		.00000
.493	.77869		.78462		.00406		.00000
.494	.77913		.78505		.00408		.00000
2.495	0.77957	44.0	0.78548	42.8	0.00409	1.2	0.00000
.496	.78001		.78591		.00410		.00000
.497	.78045		.78634		.00411		.00000
.498	.78089		.78677		.00412		.00000
.499	.78133		.78719		.00414		.00000
2.500	0.78177	44.0	0.78762	42.8	0.00415	1.2	0.00000
u	log tanh u	= F ₁ '	log coth u	= F ₂ '	log tanh u	= F ₃ '	log coth u

Logarithms of Hyperbolic Functions.

u	log sinh u	= F'	log cosh u	= F'	log tanh u	= F'	log coth u
2.500	0.78177	44.0	0.78762	42.8	0.00415	1.2	0.00585
.501	.78221		.78805		.00416		.00586
.502	.78265		.78848	42.0	.00417		.00587
.503	.78309		.78891		.00418		.00588
.504	.78353		.78934		.00419		.00589
2.505	0.78397	44.0	0.78977	42.0	0.00421	1.2	0.00590
.506	.78441		.79019		.00422		.00591
.507	.78485		.79062		.00423		.00592
.508	.78529		.79105		.00424		.00593
.509	.78573		.79148		.00425	1.1	.00594
2.510	0.78617	44.0	0.79191	42.0	0.00426	1.1	0.00595
.511	.78661		.79234		.00427		.00596
.512	.78705		.79277		.00428		.00597
.513	.78749		.79320		.00429		.00598
.514	.78793		.79363		.00431		.00599
2.515	0.78837	44.0	0.79405	42.0	0.00432	1.1	0.00600
.516	.78881		.79448		.00433		.00601
.517	.78925		.79491		.00434		.00602
.518	.78969		.79534		.00435		.00603
.519	.79013		.79577		.00437		.00604
2.520	0.79057	44.0	0.79619	42.0	0.00438	1.1	0.00605
.521	.79101		.79662		.00439		.00606
.522	.79145		.79705		.00440		.00607
.523	.79189		.79748		.00441		.00608
.524	.79233		.79791		.00442		.00609
2.525	0.79277	44.0	0.79834	42.0	0.00443	1.1	0.00610
.526	.79321		.79877		.00444		.00611
.527	.79365		.79920		.00445		.00612
.528	.79409		.79963		.00447		.00613
.529	.79453		.80005		.00448		.00614
2.530	0.79497	44.0	0.80048	42.0	0.00449	1.1	0.00615
.531	.79541		.80091		.00450		.00616
.532	.79585		.80134		.00451		.00617
.533	.79629		.80177		.00452		.00618
.534	.79673		.80220		.00453		.00619
2.535	0.79717	44.0	0.80263	42.0	0.00454	1.1	0.00620
.536	.79761		.80306		.00455		.00621
.537	.79805		.80348		.00456		.00622
.538	.79849		.80391		.00458		.00623
.539	.79893		.80434		.00459		.00624
2.540	0.79937	44.0	0.80477	42.0	0.00460	1.1	0.00625
.541	.79981		.80520		.00461		.00626
.542	.80025		.80563		.00462		.00627
.543	.80069		.80606		.00463		.00628
.544	.80113		.80649		.00464		.00629
2.545	0.80157	44.0	0.80692	42.0	0.00465	1.1	0.00630
.546	.80201		.80734		.00466		.00631
.547	.80245		.80777		.00467		.00632
.548	.80289		.80820		.00468		.00633
.549	.80333		.80863		.00469		.00634
2.550	0.80377	44.0	0.80906	42.0	0.00470	1.1	0.00635
u	log tanh u	= F'	log coth u	= F'	log tanh u	= F'	log coth u

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	u/F'	$\log \cosh u$	u/F'	$\log \tanh u$	u/F'	$\log \coth u$
4.530	0.86177	430	0.86906	440	0.00170	1.1	0.00530
.531	.86180		.86910		.00171		.00531
.532	.86184		.86914		.00172		.00532
.533	.86188		.86918		.00173		.00533
.534	.86192		.86922		.00174		.00534
4.535	0.86196	440	0.86121	440	0.00175	1.0	0.00535
.536	.86199		.86124		.00177		.00536
.537	.86203		.86128		.00178		.00537
.538	.86207		.86132		.00179		.00538
.539	.86211		.86136		.00180		.00539
4.540	0.86215	450	0.86135	450	0.00181	1.0	0.00540
.541	.86218		.86138		.00182		.00541
.542	.86222		.86142		.00183		.00542
.543	.86226		.86146		.00184		.00543
.544	.86230		.86150		.00185		.00544
4.545	0.86234	460	0.86150	460	0.00186	1.0	0.00545
.546	.86237		.86153		.00187		.00546
.547	.86241		.86157		.00188		.00547
.548	.86245		.86161		.00189		.00548
.549	.86249		.86165		.00190		.00549
4.550	0.86253	470	0.86170	470	0.00191	1.0	0.00550
.551	.86256		.86174		.00192		.00551
.552	.86260		.86178		.00193		.00552
.553	.86264		.86182		.00194		.00553
.554	.86268		.86186		.00195		.00554
4.555	0.86272	480	0.86190	480	0.00196	1.0	0.00555
.556	.86275		.86193		.00197		.00556
.557	.86279		.86197		.00198		.00557
.558	.86283		.86201		.00199		.00558
.559	.86287		.86205		.00200		.00559
4.560	0.86291	490	0.86204	490	0.00201	1.0	0.00560
.561	.86294		.86207		.00202		.00561
.562	.86298		.86211		.00203		.00562
.563	.86302		.86215		.00204		.00563
.564	.86306		.86219		.00205		.00564
4.565	0.86310	500	0.86220	500	0.00206	1.0	0.00565
.566	.86313		.86223		.00207		.00566
.567	.86317		.86227		.00208		.00567
.568	.86321		.86231		.00209		.00568
.569	.86325		.86235		.00210		.00569
4.570	0.86329	510	0.86239	510	0.00211	1.0	0.00570
.571	.86332		.86242		.00212		.00571
.572	.86336		.86246		.00213		.00572
.573	.86340		.86250		.00214		.00573
.574	.86344		.86254		.00215		.00574
4.575	0.86348	520	0.86258	520	0.00216	1.0	0.00575
.576	.86351		.86261		.00217		.00576
.577	.86355		.86265		.00218		.00577
.578	.86359		.86269		.00219		.00578
.579	.86363		.86273		.00220		.00579
4.580	0.86367	530	0.86277	530	0.00221	1.0	0.00580
.581	.86370		.86280		.00222		.00581
.582	.86374		.86284		.00223		.00582
.583	.86378		.86288		.00224		.00583
.584	.86382		.86292		.00225		.00584
4.585	0.86386	540	0.86296	540	0.00226	1.0	0.00585
.586	.86389		.86299		.00227		.00586
.587	.86393		.86303		.00228		.00587
.588	.86397		.86307		.00229		.00588
.589	.86401		.86311		.00230		.00589
4.590	0.86405	550	0.86315	550	0.00231	1.0	0.00590
.591	.86408		.86318		.00232		.00591
.592	.86412		.86322		.00233		.00592
.593	.86416		.86326		.00234		.00593
.594	.86420		.86330		.00235		.00594
4.595	0.86424	560	0.86334	560	0.00236	1.0	0.00595
.596	.86427		.86337		.00237		.00596
.597	.86431		.86341		.00238		.00597
.598	.86435		.86345		.00239		.00598
.599	.86439		.86349		.00240		.00599
4.600	0.86443	570	0.86353	570	0.00241	1.0	0.00600
.601	.86446		.86356		.00242		.00601
.602	.86450		.86360		.00243		.00602
.603	.86454		.86364		.00244		.00603
.604	.86458		.86368		.00245		.00604
4.605	0.86462	580	0.86372	580	0.00246	1.0	0.00605
.606	.86465		.86375		.00247		.00606
.607	.86469		.86379		.00248		.00607
.608	.86473		.86383		.00249		.00608
.609	.86477		.86387		.00250		.00609
4.610	0.86481	590	0.86391	590	0.00251	1.0	0.00610
.611	.86484		.86394		.00252		.00611
.612	.86488		.86398		.00253		.00612
.613	.86492		.86402		.00254		.00613
.614	.86496		.86406		.00255		.00614
4.615	0.86500	600	0.86410	600	0.00256	1.0	0.00615
.616	.86503		.86413		.00257		.00616
.617	.86507		.86417		.00258		.00617
.618	.86511		.86421		.00259		.00618
.619	.86515		.86425		.00260		.00619
4.620	0.86519	610	0.86429	610	0.00261	1.0	0.00620
.621	.86522		.86432		.00262		.00621
.622	.86526		.86436		.00263		.00622
.623	.86530		.86440		.00264		.00623
.624	.86534		.86444		.00265		.00624
4.625	0.86538	620	0.86448	620	0.00266	1.0	0.00625
.626	.86541		.86451		.00267		.00626
.627	.86545		.86455		.00268		.00627
.628	.86549		.86459		.00269		.00628
.629	.86553		.86463		.00270		.00629
4.630	0.86557	630	0.86467	630	0.00271	1.0	0.00630
.631	.86560		.86470		.00272		.00631
.632	.86564		.86474		.00273		.00632
.633	.86568		.86478		.00274		.00633
.634	.86572		.86482		.00275		.00634
4.635	0.86576	640	0.86486	640	0.00276	1.0	0.00635
.636	.86579		.86489		.00277		.00636
.637	.86583		.86493		.00278		.00637
.638	.86587		.86497		.00279		.00638
.639	.86591		.86501		.00280		.00639
4.640	0.86595	650	0.86505	650	0.00281	1.0	0.00640
.641	.86598		.86508		.00282		.00641
.642	.86602		.86512		.00283		.00642
.643	.86606		.86516		.00284		.00643
.644	.86610		.86520		.00285		.00644
4.645	0.86614	660	0.86524	660	0.00286	1.0	0.00645
.646	.86617		.86527		.00287		.00646
.647	.86621		.86531		.00288		.00647
.648	.86625		.86535		.00289		.00648
.649	.86629		.86539		.00290		.00649
4.650	0.86633	670	0.86543	670	0.00291	1.0	0.00650
.651	.86636		.86546		.00292		.00651
.652	.86640		.86550		.00293		.00652
.653	.86644		.86554		.00294		.00653
.654	.86648		.86558		.00295		.00654
4.655	0.86652	680	0.86562	680	0.00296	1.0	0.00655
.656	.86655		.86565		.00297		.00656
.657	.86659		.86569		.00298		.00657
.658	.86663		.86573		.00299		.00658
.659	.86667		.86577		.00300		.00659
4.660	0.86671	690	0.86581	690	0.00301	1.0	0.00660
.661	.86674		.86584		.00302		.00661
.662	.86678		.86588		.00303		.00662
.663	.86682		.86592		.00304		.00663
.664	.86686		.86596		.00305		.00664
4.665	0.86690	700	0.86599	700	0.00306	1.0	0.00665
.666	.86693		.86603		.00307		.00666
.667	.86697		.86607		.00308		.00667
.668	.86701		.86611		.00309		.00668
.669	.86705		.86615		.00310		.00669
4.670	0.86709	710	0.86619	710	0.00311	1.0	0.00670
.671	.86712		.86622		.00312		.00671
.672	.86716		.86626		.00313		.00672
.673	.86720		.86630		.00314		.00673
.674	.86724		.86634		.00315		.00674
4.675	0.86728	720	0.86638	720	0.00316	1.0	0.00675
.676	.86731		.86641		.00317		.00676
.677	.86735		.86645		.00318		.00677
.678	.86739		.86649		.00319		.00678
.679	.86743		.86653		.00320		.00679
4.680	0.86747	730	0.86657	730	0.00321	1.0	0.00680
.681	.86750		.86660		.00322		.00681
.682	.86754		.86664		.00323		.00682
.683	.86758		.86668		.00324		.00683
.684	.86762		.86672		.00325		.00684
4.685	0.86766	740	0.86676	740	0.00326	1.0	0.00685
.686	.86769		.86679		.00327		.00686
.687	.86773		.86683		.00328		.00687
.688	.86777		.86687		.00329		.00688
.689	.86781		.86691		.00330		.00689
4.690	0.86785	750	0.86695	750	0.00331	1.0	0.00690
.691	.86788		.86698		.00332		.00691
.692	.86792		.86702		.00333		.00692
.693	.86796		.86706		.00334		.00693
.694	.86800		.86710		.00335		.00694
4.695	0.86804	760	0.86714	760	0.00336	1.0	0.00695
.696	.86807		.86717		.00337		.00696
.697	.86811		.86721		.00338		.00697
.698	.86815		.86725		.00339		.00698
.699	.86819		.86729		.00340		.00699
4.700	0.86823	770	0.86733	770	0.00341	1.0	0.00700
.701	.86826		.86736		.00342		.00701
.702	.86830		.86740		.00343		.00702
.703	.86834</						

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$w = F_1'$	$\log \cosh u$	$w = F_2'$	$\log \tanh u$	$w = F_3'$	$\log \coth u$
2.600	0.82573	430	0.83052	430	9.00521	1.0	0.00470
.601	.82577		.83055		.00522		.00475
.602	.82581		.83138		.00523		.00477
.603	.82705		.83181		.00524		.00476
.604	.82749		.83224		.00525		.00475
2.605	0.82793	430	0.83267	430	9.00526	0.9	0.00474
.606	.82837		.83310		.00527		.00473
.607	.82881		.83353		.00527		.00473
.608	.82925		.83396		.00528		.00472
.609	.82968		.83439		.00529		.00471
2.610	0.83012	430	0.83482	430	9.00530	0.9	0.00470
.611	.83056		.83525		.00531		.00469
.612	.83100		.83568		.00532		.00468
.613	.83144		.83611		.00533		.00467
.614	.83188		.83654		.00534		.00466
2.615	0.83232	430	0.83697	430	9.00535	0.9	0.00465
.616	.83276		.83740		.00536		.00464
.617	.83320		.83783		.00537		.00463
.618	.83364		.83826		.00538		.00462
.619	.83407		.83869		.00539		.00461
2.620	0.83451	430	0.83912	430	9.00540	0.9	0.00460
.621	.83495		.83955		.00541		.00459
.622	.83539		.83998		.00541		.00459
.623	.83583		.84041		.00542		.00458
.624	.83627		.84084		.00543		.00457
2.625	0.83671	430	0.84127	430	9.00544	0.9	0.00456
.626	.83715		.84170		.00545		.00455
.627	.83759		.84213		.00546		.00454
.628	.83802		.84256		.00547		.00453
.629	.83846		.84299		.00548		.00452
2.630	0.83890	430	0.84341	430	9.00549	0.9	0.00451
.631	.83934		.84384		.00550		.00450
.632	.83978		.84427		.00551		.00449
.633	.84022		.84470		.00551		.00449
.634	.84065		.84513		.00552		.00448
2.635	0.84110	430	0.84556	430	9.00553	0.9	0.00447
.636	.84154		.84599		.00554		.00446
.637	.84197		.84642		.00555		.00445
.638	.84241		.84685		.00556		.00444
.639	.84285		.84728		.00557		.00443
2.640	0.84329	430	0.84771	430	9.00558	0.9	0.00442
.641	.84373		.84814		.00559		.00441
.642	.84417		.84857		.00560		.00441
.643	.84461		.84900		.00560		.00440
.644	.84505		.84943		.00561		.00439
2.645	0.84548	430	0.84986	430	9.00562	0.9	0.00438
.646	.84592		.85029		.00563		.00437
.647	.84636		.85072		.00564		.00436
.648	.84680		.85115		.00565		.00435
.649	.84724		.85158		.00566		.00434
2.650	0.84768	430	0.85201	430	9.00566	0.9	0.00434
u	$\log \sinh u$	$w = F_1'$	$\log \cosh u$	$w = F_2'$	$\log \tanh u$	$w = F_3'$	$\log \coth u$

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F'$	$\log \cosh u$	$= F'$	$\log \tanh u$	$= F'$	$\log \coth u$
2.650	0.84768	43.0	0.85201	43.0	9.99966	0.0	0.00434
.651	.84812		.85244		.99977		.00433
.652	.84855		.85287		.99988		.00432
.653	.84899		.85330		.99999		.00431
.654	.84943		.85373		.99970		.00430
2.655	0.84987	43.0	0.85416	43.0	9.99971	0.0	0.00429
.656	.85031		.85459		.99972		.00428
.657	.85075		.85502		.99973		.00428
.658	.85119		.85545		.99974		.00427
.659	.85162		.85588		.99974		.00426
2.660	0.85206	43.0	0.85631	43.0	9.99975	0.8	0.00425
.661	.85249		.85674		.99976		.00424
.662	.85294		.85717		.99977		.00423
.663	.85338		.85760		.99978		.00422
.664	.85382		.85803		.99978		.00422
2.665	0.85426	43.0	0.85846	43.0	9.99979	0.8	0.00421
.666	.85469		.85889		.99980		.00420
.667	.85513		.85932		.99981		.00419
.668	.85557	43.8	.85975		.99982		.00418
.669	.85601		.86018		.99983		.00417
2.670	0.85645	43.8	0.86061	43.0	9.99983	0.8	0.00417
.671	.85689		.86104		.99984		.00416
.672	.85733		.86147		.99985		.00415
.673	.85776		.86190		.99986		.00414
.674	.85820		.86233		.99987		.00413
2.675	0.85863	43.8	0.86276	43.0	9.99988	0.8	0.00412
.676	.85908		.86320		.99988		.00412
.677	.85952		.86363		.99989		.00411
.678	.85996		.86406		.99990		.00410
.679	.86039		.86449		.99991		.00409
2.680	0.86083	43.8	0.86492	43.0	9.99992	0.8	0.00408
.681	.86127		.86535		.99992		.00408
.682	.86171		.86578		.99993		.00407
.683	.86215		.86621		.99994		.00406
.684	.86259		.86664		.99995		.00405
2.685	0.86302	43.8	0.86707	43.0	9.99996	0.8	0.00404
.686	.86346		.86750		.99997		.00403
.687	.86390		.86793		.99997		.00403
.688	.86434		.86836		.99998		.00402
.689	.86478		.86879		.99999		.00401
2.690	0.86522	43.8	0.86923	43.0	9.99999	0.8	0.00400
.691	.86565		.86966		.99999		.00399
.692	.86609		.87009		.99999		.00399
.693	.86653		.87051		.99999		.00398
.694	.86697		.87094		.99999		.00397
2.695	0.86741	43.8	0.87137	43.0	9.99999	0.8	0.00396
.696	.86785		.87180		.99999		.00395
.697	.86828		.87223		.99999		.00395
.698	.86872		.87266		.99999		.00394
.699	.86916		.87309		.99999		.00393
2.700	0.86960	43.8	0.87352	43.0	9.99999	0.8	0.00392
u	$\log \tanh u$	$= F'$	$\log \coth u$	$= F'$	$\log \sinh u$	$= F'$	$\log \cosh u$

SMITHSONIAN TABLE

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
2.700	0.86964	43.8	0.87235	43.9	0.00271	0.5	0.00032
.701	.87002		.87273		.00272		.00032
.702	.87040		.87315		.00273		.00032
.703	.87079		.87357		.00274		.00032
.704	.87115		.87399		.00275		.00032
2.705	0.87159	43.8	0.87440	43.9	0.00276	0.5	0.00032
.706	.87193		.87482		.00277		.00032
.707	.87229		.87524		.00278		.00032
.708	.87265		.87566		.00279		.00032
.709	.87301		.87608		.00280		.00032
2.710	0.87346	43.8	0.87649	43.9	0.00281	0.5	0.00032
.711	.87382		.87691		.00282		.00032
.712	.87418		.87733		.00283		.00032
.713	.87454		.87775		.00284		.00032
.714	.87490		.87817		.00285		.00032
2.715	0.87534	43.8	0.87859	43.9	0.00286	0.5	0.00032
.716	.87570		.87901		.00287		.00032
.717	.87606		.87943		.00288		.00032
.718	.87642		.87985		.00289		.00032
.719	.87678		.88027		.00290		.00032
2.720	0.87722	43.8	0.88069	43.9	0.00291	0.5	0.00032
.721	.87758		.88111		.00292		.00032
.722	.87794		.88153		.00293		.00032
.723	.87830		.88195		.00294		.00032
.724	.87866		.88237		.00295		.00032
2.725	0.87910	43.8	0.88279	43.9	0.00296	0.5	0.00032
.726	.87946		.88321		.00297		.00032
.727	.87982		.88363		.00298		.00032
.728	.88018		.88405		.00299		.00032
.729	.88054		.88447		.00300		.00032
2.730	0.88098	43.8	0.88489	43.9	0.00301	0.5	0.00032
.731	.88134		.88531		.00302		.00032
.732	.88170		.88573		.00303		.00032
.733	.88206		.88615		.00304		.00032
.734	.88242		.88657		.00305		.00032
2.735	0.88286	43.8	0.88699	43.9	0.00306	0.5	0.00032
.736	.88322		.88741		.00307		.00032
.737	.88358		.88783		.00308		.00032
.738	.88394		.88825		.00309		.00032
.739	.88430		.88867		.00310		.00032
2.740	0.88474	43.8	0.88909	43.9	0.00311	0.5	0.00032
.741	.88510		.88951		.00312		.00032
.742	.88546		.88993		.00313		.00032
.743	.88582		.89035		.00314		.00032
.744	.88618		.89077		.00315		.00032
2.745	0.88662	43.8	0.89119	43.9	0.00316	0.5	0.00032
.746	.88698		.89161		.00317		.00032
.747	.88734		.89203		.00318		.00032
.748	.88770		.89245		.00319		.00032
.749	.88806		.89287		.00320		.00032
2.750	0.88850	43.8	0.89329	43.9	0.00321	0.5	0.00032
u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

u	log sinh u	= F'	log cosh u	= F'	log tanh u	= F'	log coth u
2.750	0.89150	43.8	0.89595	43.1	9.99645	0.7	0.00355
.751	.89194		.89588		.99646		.00354
.752	.89238		.89581		.99646		.00354
.753	.89281		.89574		.99647		.00353
.754	.89325		.89567		.99648		.00352
2.755	0.89369	43.8	0.89720	43.1	9.99689	0.7	0.00351
.756	.89413		.89714		.99689		.00351
.757	.89457		.89707		.99690		.00350
.758	.89500		.89700		.99691		.00349
.759	.89544		.89693		.99691		.00349
2.760	0.89588	43.8	0.89936	43.1	9.99732	0.7	0.00348
.761	.89632		.89930		.99733		.00347
.762	.89676		.99923		.99733		.00347
.763	.89719		.99916		.99734		.00346
.764	.89763		.99908		.99735		.00345
2.765	0.89807	43.8	0.90051	43.1	9.99775	0.7	0.00344
.766	.89851		.90044		.99776		.00344
.767	.89894		.90037		.99777		.00343
.768	.89938		.90030		.99778		.00342
.769	.89982		.90024		.99778		.00342
2.770	0.90026	43.8	0.90167	43.1	9.99819	0.7	0.00341
.771	.90069		.90160		.99820		.00340
.772	.90113		.90153		.99820		.00340
.773	.90157		.90146		.99821		.00339
.774	.90201		.90139		.99822		.00338
2.775	0.90245	43.8	0.90282	43.1	9.99862	0.7	0.00338
.776	.90288		.90275		.99863		.00337
.777	.90332		.90268		.99864		.00336
.778	.90376		.90261		.99864		.00336
.779	.90420		.90255		.99865		.00335
2.780	0.90463	43.8	0.90298	43.1	9.99906	0.7	0.00334
.781	.90507		.90291		.99906		.00334
.782	.90551		.90284		.99907		.00333
.783	.90595		.90277		.99908		.00332
.784	.90638		.90270		.99908		.00332
2.785	0.90682	43.8	0.90313	43.1	9.99949	0.7	0.00331
.786	.90726		.90306		.99950		.00330
.787	.90770		.90300		.99950		.00330
.788	.90813		.90293		.99951		.00329
.789	.90857		.90286		.99951		.00328
2.790	0.90901	43.8	0.90329	43.1	9.99992	0.7	0.00328
.791	.90945		.90322		.99993		.00327
.792	.90989		.90315		.99994		.00326
.793	.91032		.90308		.99994		.00326
.794	.91076		.90301		.99995		.00325
2.795	0.91120	43.8	0.90344	43.1	9.99996	0.6	0.00324
.796	.91164		.90337		.99996		.00324
.797	.91207		.90330		.99997		.00323
.798	.91251		.90324		.99998		.00322
.799	.91295		.90317		.99998		.00322
2.800	0.91339	43.8	0.90360	43.1	9.99999	0.6	0.00321
u	log tanh u	= F'	log coth u	= F'	log tanh u	= F'	log coth u

Logarithms of Hyperbolic Functions.

u	log sinh u	= F ₁ '	log cosh u	= F ₂ '	log tanh u	= F ₃ '	log coth u
2.800	0.91339	43.8	0.91660	43.1	0.00320	0.0	0.00121
.801	.91362		.91683		.00343		.00121
.802	.91386		.91706		.00366		.00120
.803	.91409	43.7	.91729	43.0	.00389	0.0	.00119
.804	.91531		.91851		.00412		.00119
2.805	0.91552	43.7	0.91872	43.1	0.00435	0.0	0.00118
.806	.91575		.91895		.00458		.00117
.807	.91598		.91918		.00481		.00117
.808	.91620		.91940		.00504		.00116
.809	.91742		.92062		.00527		.00115
2.810	0.91776	43.7	0.92096	43.1	0.00551	0.0	0.00115
.811	.91820		.92140		.00574		.00114
.812	.91864		.92184		.00597		.00114
.813	.91907		.92228		.00620		.00113
.814	.91951		.92271		.00643		.00112
2.815	0.91995	43.7	0.92315	43.1	0.00667	0.0	0.00112
.816	.92039		.92359		.00690		.00111
.817	.92082		.92402		.00713		.00110
.818	.92126		.92446		.00736		.00110
.819	.92170		.92489		.00759		.00109
2.820	0.92213	43.7	0.92533	43.1	0.00783	0.0	0.00109
.821	.92257		.92576		.00806		.00108
.822	.92301		.92620		.00829		.00107
.823	.92345		.92663		.00852		.00107
.824	.92388		.92707		.00875		.00106
2.825	0.92432	43.7	0.92750	43.1	0.00899	0.0	0.00106
.826	.92476		.92794		.00922		.00105
.827	.92520		.92837		.00945		.00105
.828	.92563		.92881		.00968		.00104
.829	.92607		.92924		.00991		.00103
2.830	0.92651	43.7	0.92968	43.1	0.01015	0.0	0.00103
.831	.92695		.93011		.01038		.00102
.832	.92738		.93055		.01061		.00101
.833	.92782		.93098		.01084		.00101
.834	.92826		.93142		.01107		.00100
2.835	0.92869	43.7	0.93186	43.1	0.01131	0.0	0.00100
.836	.92913		.93229		.01154		.00099
.837	.92957		.93273		.01177		.00098
.838	.92999		.93317		.01200		.00098
.839	.93044		.93361		.01223		.00097
2.840	0.93088	43.7	0.93405	43.1	0.01247	0.0	0.00097
.841	.93132		.93448		.01270		.00096
.842	.93176		.93492		.01293		.00095
.843	.93219		.93536		.01316		.00095
.844	.93263		.93579		.01339		.00094
2.845	0.93307	43.7	0.93623	43.1	0.01363	0.0	0.00094
.846	.93351		.93667		.01386		.00093
.847	.93394		.93710		.01409		.00093
.848	.93438		.93754		.01432		.00092
.849	.93482		.93797		.01455		.00091
2.850	0.93525	43.7	0.93841	43.1	0.01479	0.0	0.00091
u	log tanh u	= F ₁	log coth u	= F ₂	log sinh u	= F ₃	log cosh u

Logarithms of Hyperbolic Functions.

u	log sinh u	= F ₂ '	log cosh u	= F ₂ '	log tanh u	= F ₂ '	log coth u
2.890	0.01515	43.7	0.01806	43.1	9.99709	0.6	0.01291
.891	0.01519		0.01809		9.99710		0.01290
.892	0.01523		0.01812		9.99711		0.01289
.893	0.01527		0.01815		9.99711		0.01289
.894	0.01530		0.01819		9.99712		0.01288
2.895	0.01534	43.7	0.01822	43.1	9.99712	0.6	0.01288
.896	0.01538		0.01825		9.99713		0.01287
.897	0.01541		0.01828		9.99713		0.01287
.898	0.01545		0.01831		9.99714		0.01286
.899	0.01549		0.01834		9.99715		0.01285
2.890	0.01564	43.7	0.01847	43.1	9.99715	0.6	0.01285
.891	0.01566		0.01849		9.99716		0.01284
.892	0.01569		0.01853		9.99716		0.01284
.893	0.01573		0.01857		9.99717		0.01283
.894	0.01577		0.01860		9.99717		0.01283
2.895	0.01581	43.7	0.01863	43.1	9.99718	0.6	0.01282
.896	0.01585		0.01866		9.99719		0.01281
.897	0.01589		0.01870		9.99719		0.01281
.898	0.01592		0.01873		9.99720		0.01280
.899	0.01596		0.01876	43.2	9.99720		0.01280
2.890	0.01608	43.7	0.01879	43.2	9.99721	0.6	0.01279
.891	0.01613		0.01882		9.99721		0.01279
.892	0.01617		0.01885		9.99722		0.01278
.893	0.01621		0.01888		9.99722		0.01278
.894	0.01625		0.01891		9.99723		0.01277
2.895	0.01628	43.7	0.01895	43.2	9.99723	0.6	0.01276
.896	0.01632		0.01898		9.99724		0.01276
.897	0.01636		0.01901		9.99725		0.01275
.898	0.01640		0.01904		9.99725	0.5	0.01275
.899	0.01643		0.01907		9.99726		0.01274
2.890	0.01657	43.7	0.01910	43.2	9.99726	0.5	0.01274
.891	0.01660		0.01913		9.99727		0.01273
.892	0.01664		0.01916		9.99727		0.01273
.893	0.01668		0.01919		9.99728		0.01272
.894	0.01672		0.01923		9.99728		0.01272
2.895	0.01685	43.7	0.01926	43.2	9.99729	0.5	0.01271
.896	0.01689		0.01929		9.99730		0.01270
.897	0.01693		0.01933		9.99730		0.01270
.898	0.01696		0.01936		9.99731		0.01269
.899	0.01700		0.01939		9.99731		0.01269
2.890	0.01714	43.7	0.01942	43.2	9.99731	0.5	0.01268
.891	0.01717		0.01945		9.99732		0.01268
.892	0.01721		0.01948		9.99733		0.01267
.893	0.01725		0.01952		9.99733		0.01267
.894	0.01729		0.01955		9.99734		0.01266
2.895	0.01742	43.7	0.01958	43.2	9.99734	0.5	0.01266
.896	0.01746		0.01961		9.99735		0.01265
.897	0.01750		0.01964		9.99735		0.01265
.898	0.01753		0.01967		9.99736		0.01264
.899	0.01757		0.01971		9.99737		0.01263
2.900	0.01771	43.7	0.01974	43.2	9.99737	0.5	0.01263
u	log tan pu	= F ₂ '	log sec pu	= F ₂ '	log sin pu	= F ₂ '	log cos pu

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$\equiv F_1'$	$\log \cosh u$	$\equiv F_2'$	$\log \tanh u$	$\equiv F_3'$	$\log \coth u$
2.000	0.56911	43.7	0.57034	43.7	0.00123	0.5	0.00123
.001	.56954		.57077		.00165		.00165
.002	.56998		.57120		.00208		.00208
.003	.57042		.57163		.00251		.00251
.004	.57085		.57206		.00294		.00294
2.005	0.57129	43.7	0.57249	43.7	0.00337	0.5	0.00337
.006	.57173		.57292		.00380		.00380
.007	.57217		.57335		.00423		.00423
.008	.57260		.57378		.00466		.00466
.009	.57304		.57421		.00509		.00509
2.010	0.57348	43.7	0.57464	43.7	0.00552	0.5	0.00552
.011	.57391		.57507		.00595		.00595
.012	.57435		.57549		.00638		.00638
.013	.57479		.57592		.00681		.00681
.014	.57522		.57635		.00724		.00724
2.015	0.57566	43.7	0.57671	43.7	0.00767	0.5	0.00767
.016	.57610		.57714		.00810		.00810
.017	.57653		.57757		.00853		.00853
.018	.57697		.57800		.00896		.00896
.019	.57740		.57843		.00939		.00939
2.020	0.57784	43.7	0.57889	43.7	0.00982	0.5	0.00982
.021	.57828		.57931		.01025		.01025
.022	.57871		.57974		.01068		.01068
.023	.57915		.58017		.01111		.01111
.024	.57958		.58060		.01154		.01154
2.025	0.58002	43.7	0.58107	43.7	0.01197	0.5	0.01197
.026	.58045		.58149		.01240		.01240
.027	.58089		.58192		.01283		.01283
.028	.58132		.58235		.01326		.01326
.029	.58176		.58278		.01369		.01369
2.030	0.58219	43.7	0.58324	43.7	0.01412	0.5	0.01412
.031	.58263		.58365		.01455		.01455
.032	.58306		.58408		.01498		.01498
.033	.58350		.58452		.01541		.01541
.034	.58393		.58495		.01584		.01584
2.035	0.58437	43.7	0.58542	43.7	0.01627	0.5	0.01627
.036	.58480		.58582		.01670		.01670
.037	.58524		.58626		.01713		.01713
.038	.58567		.58669		.01756		.01756
.039	.58611		.58713		.01799		.01799
2.040	0.58654	43.7	0.58759	43.7	0.01842	0.5	0.01842
.041	.58698		.58800		.01885		.01885
.042	.58741		.58843		.01928		.01928
.043	.58785		.58886		.01971		.01971
.044	.58828		.58929		.02014		.02014
2.045	0.58872	43.7	0.58977	43.7	0.02057	0.5	0.02057
.046	.58915		.59017		.02100		.02100
.047	.58959		.59060		.02143		.02143
.048	.59002		.59103		.02186		.02186
.049	.59046		.59148		.02229		.02229
2.050	0.59089	43.7	0.59194	43.7	0.02272	0.5	0.02272
.051	.59133		.59234		.02315		.02315
.052	.59176		.59277		.02358		.02358
.053	.59220		.59321		.02401		.02401
.054	.59263		.59364		.02444		.02444
2.055	0.59307	43.7	0.59412	43.7	0.02487	0.5	0.02487
.056	.59350		.59451		.02530		.02530
.057	.59394		.59495		.02573		.02573
.058	.59437		.59538		.02616		.02616
.059	.59481		.59582		.02659		.02659
2.060	0.59524	43.7	0.59629	43.7	0.02702	0.5	0.02702
.061	.59568		.59669		.02745		.02745
.062	.59611		.59712		.02788		.02788
.063	.59655		.59756		.02831		.02831
.064	.59698		.59799		.02874		.02874
2.065	0.59742	43.7	0.59847	43.7	0.02917	0.5	0.02917
.066	.59785		.59886		.02960		.02960
.067	.59829		.59930		.03003		.03003
.068	.59872		.59973		.03046		.03046
.069	.59916		.60017		.03089		.03089
2.070	0.59959	43.7	0.60064	43.7	0.03132	0.5	0.03132
.071	.60003		.60103		.03175		.03175
.072	.60046		.60146		.03218		.03218
.073	.60090		.60189		.03261		.03261
.074	.60133		.60233		.03304		.03304
2.075	0.60177	43.7	0.60282	43.7	0.03347	0.5	0.03347
.076	.60220		.60320		.03390		.03390
.077	.60264		.60363		.03433		.03433
.078	.60307		.60407		.03476		.03476
.079	.60351		.60450		.03519		.03519
2.080	0.60394	43.7	0.60499	43.7	0.03562	0.5	0.03562
.081	.60438		.60537		.03605		.03605
.082	.60481		.60580		.03648		.03648
.083	.60525		.60624		.03691		.03691
.084	.60568		.60667		.03734		.03734
2.085	0.60612	43.7	0.60717	43.7	0.03777	0.5	0.03777
.086	.60655		.60754		.03820		.03820
.087	.60699		.60797		.03863		.03863
.088	.60742		.60840		.03906		.03906
.089	.60786		.60883		.03949		.03949
2.090	0.60829	43.7	0.60934	43.7	0.03992	0.5	0.03992
.091	.60873		.60976		.04035		.04035
.092	.60916		.61019		.04078		.04078
.093	.60960		.61062		.04121		.04121
.094	.61003		.61106		.04164		.04164
2.095	0.61047	43.7	0.61152	43.7	0.04207	0.5	0.04207
.096	.61090		.61193		.04250		.04250
.097	.61134		.61236		.04293		.04293
.098	.61177		.61279		.04336		.04336
.099	.61221		.61323		.04379		.04379
2.100	0.61264	43.7	0.61369	43.7	0.04422	0.5	0.04422
.101	.61308		.61410		.04465		.04465
.102	.61351		.61453		.04508		.04508
.103	.61395		.61497		.04551		.04551
.104	.61438		.61540		.04594		.04594
2.105	0.61482	43.7	0.61587	43.7	0.04637	0.5	0.04637
.106	.61525		.61627		.04680		.04680
.107	.61569		.61670		.04723		.04723
.108	.61612		.61714		.04766		.04766
.109	.61656		.61757		.04809		.04809
2.110	0.61699	43.7	0.61804	43.7	0.04852	0.5	0.04852
.111	.61743		.61845		.04895		.04895
.112	.61786		.61888		.04938		.04938
.113	.61830		.61932		.04981		.04981
.114	.61873		.61975		.05024		.05024
2.115	0.61917	43.7	0.62022	43.7	0.05067	0.5	0.05067
.116	.61960		.62062		.05110		.05110
.117	.62004		.62106		.05153		.05153
.118	.62047		.62149		.05196		.05196
.119	.62091		.62193		.05239		.05239
2.120	0.62134	43.7	0.62239	43.7	0.05282	0.5	0.05282
.121	.62178		.62280		.05325		.05325
.122	.62221		.62323		.05368		.05368
.123	.62265		.62367		.05411		.05411
.124	.62308		.62410		.05454		.05454
2.125	0.62352	43.7	0.62457	43.7	0.05497	0.5	0.05497
.126	.62395		.62497		.05540		.05540
.127	.62439		.62541		.05583		.05583
.128	.62482		.62584		.05626		.05626
.129	.62526		.62628		.05669		.05669
2.130	0.62569	43.7	0.62674	43.7	0.05712	0.5	0.05712
.131	.62613		.62715		.05755		.05755
.132	.62656		.62758		.05798		.05798
.133	.62700		.62802		.05841		.05841
.134	.62743		.62845		.05884		.05884
2.135	0.62787	43.7	0.62892	43.7	0.05927	0.5	0.05927
.136	.62830		.62932		.05970		.05970
.137	.62874		.62975		.06013		.06013
.138	.62917		.63019		.06056		.06056
.139	.62961		.63062		.06099		.06099
2.140	0.63004	43.7	0.63109	43.7	0.06142	0.5	0.06142
.141	.63048		.63150		.06185		.06185
.142	.63091		.63193		.06228		.06228
.143	.63135		.63237		.06271		.06271
.144	.63178		.63280		.06314		.06314
2.145	0.63222	43.7	0.63327	43.7	0.06357	0.5	0.06357
.146	.63265		.63367		.06400		.06400
.147	.63309		.63411		.06443		.06443
.148	.63352		.63454		.06486		.06486
.149	.63396		.63497		.06529		.06529
2.150	0.63439	43.7	0.63544	43.7	0.06572	0.5	0.06572
.151	.63483		.63585		.06615		.06615
.152	.63526		.63628		.06658		.06658
.153	.63570		.63672		.06701		.06701
.154	.63613		.63715		.06744		.06744
2.155	0.63657	43.7	0.63762	43.7	0.06787	0.5	0.06787
.156	.63700		.63802		.06830		.06830
.157	.63744		.63846		.06873		.06873
.158	.63787		.63889		.06916		.06916
.159	.63831		.63933		.06959		.06959
2.160	0.63874	43.7	0.63979	43.7	0.07002	0.5	0.07002
.161	.63918		.64020		.07045		.07045
.162	.63961		.64063		.07088		.07088
.163	.64005		.64107		.07131		.07131
.164	.64048		.64150		.07174		.07174
2.165	0.64092	43.7	0.64197	43.7	0.07217	0.5	0.07217
.166	.64135		.64237		.07260		.07260
.167	.64179		.64280		.07303		.07303
.168	.64222		.64324		.07346		.07346
.169	.64266		.64367		.07389		.07389
2.170	0.64309	43.7	0.64414	43.7	0.07432	0.5	0.07432
.171	.64353		.64455		.07475		.07475
.1							

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
2.050	0.007935	43.7	0.08133	43.2	9.997762	0.5	0.00238
.051	.007948		.081370		.997763		.00237
.052	.007961		.081409		.997764		.00236
.053	.007974		.081446		.997765		.00235
.054	.007987		.081485		.997766		.00234
2.055	0.008013	43.7	0.081520	43.2	9.997761	0.5	0.00235
.056	.008027		.081562		.997762		.00234
.057	.008040		.081603		.997763		.00233
.058	.008054		.081645		.997764		.00232
.059	.008068		.081687		.997765		.00231
2.060	0.008111	43.7	0.081718	43.2	9.997767	0.5	0.00231
.061	.008125		.081760		.997767		.00231
.062	.008139		.081801		.997768		.00230
.063	.008152		.081843		.997769		.00229
.064	.008166		.081885		.997770		.00228
2.065	0.008200	43.7	0.081916	43.2	9.997769	0.5	0.00228
.066	.008213		.081957		.997770		.00228
.067	.008227		.081999		.997771		.00227
.068	.008240		.082040		.997772		.00226
.069	.008254		.082081		.997773		.00225
2.070	0.008298	43.7	0.082112	43.2	9.997771	0.5	0.00225
.071	.008312		.082153		.997772		.00224
.072	.008325		.082195		.997773		.00223
.073	.008339		.082236		.997774		.00222
.074	.008352		.082278		.997775		.00221
2.075	0.008386	43.7	0.082313	43.2	9.997774	0.5	0.00221
.076	.008400		.082354		.997774		.00220
.077	.008414		.082395		.997775		.00219
.078	.008427		.082437		.997776	0.4	.00218
.079	.008441		.082478		.997777		.00217
2.080	0.008485	43.7	0.082509	43.2	9.997776	0.4	0.00217
.081	.008498		.082550		.997776		.00216
.082	.008512		.082591		.997777		.00215
.083	.008525		.082633		.997777		.00214
.084	.008539		.082674		.997778		.00213
2.085	0.008583	43.7	0.082705	43.2	9.997778	0.4	0.00213
.086	.008596		.082746		.997779		.00212
.087	.008610		.082787		.997779		.00211
.088	.008624		.082828		.997780		.00210
.089	.008637		.082869		.997780		.00209
2.090	0.008681	43.6	0.082901	43.2	9.997780	0.4	0.00209
.091	.008695		.082942		.997781		.00208
.092	.008708		.082983		.997781		.00207
.093	.008722		.083024		.997782		.00206
.094	.008735		1.000111		.997782		.00205
2.095	0.008779	43.6	1.000177	43.2	9.997783	0.4	0.00205
.096	.008793		1.000218		.997783		.00204
.097	.008807		1.000259		.997783		.00203
.098	.008820		1.000300		.997784		.00202
.099	1.000334		1.000340		.997784		.00201
3.000	1.000378	43.6	1.000403	43.2	9.997785	0.4	0.00201
u	$\log \tanh u$	$= F_1'$	$\log \coth u$	$= F_2'$	$\log \sinh u$	$= F_3'$	$\log \cosh u$

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
3.00	1.00098	436.5	1.00093	435.4	9.99925	4.3	0.00025
.01	.00154	436.6	.000725	435.5	.99925	4.2	.00021
.02	.00209	436.7	.00152	435.7	.99901	4.1	.00017
.03	.00264	436.8	.00230	435.8	.99877	4.0	.00013
.04	.00319	436.9	.00307	435.9	.99853	3.9	.00009
3.05	1.00291	437.0	1.00251	436.1	9.99855	3.8	0.00005
.06	.00396	437.1	.00385	436.2	.99809	3.7	.00001
.07	.00451	437.2	.00460	436.3	.99764	3.6	.00007
.08	.00506	437.3	.00521	436.5	.99717	3.5	.00003
.09	.00561	437.4	.00581	436.6	.99671	3.4	.00000
3.10	1.00640	437.5	1.00600	436.7	9.99651	3.3	0.00076
.11	.00695	437.6	.00690	436.8	.99607	3.2	.00072
.12	.00750	437.7	.00745	436.9	.99562	3.1	.00068
.13	.00805	437.8	.00801	437.0	.99517	3.0	.00064
.14	.00860	437.9	.00857	437.1	.99472	2.9	.00060
3.15	1.00930	438.0	1.00920	437.2	9.99411	2.8	0.00059
.16	.00985	438.1	.00981	437.3	.99366	2.7	.00055
.17	.01040	438.2	.01035	437.4	.99321	2.6	.00051
.18	.01095	438.3	.01090	437.5	.99276	2.5	.00047
.19	.01150	438.4	.01145	437.6	.99231	2.4	.00043
3.20	1.00990	438.5	1.00980	437.7	9.99169	2.3	0.00044
.21	.01245	438.6	.01240	437.8	.99124	2.2	.00041
.22	.01300	438.7	.01295	437.9	.99079	2.1	.00037
.23	.01355	438.8	.01350	438.0	.99034	2.0	.00033
.24	.01410	438.9	.01405	438.1	.98989	1.9	.00029
3.25	1.00997	439.0	1.11008	438.2	9.99000	1.8	0.00031
.26	.01465	439.1	.01460	438.3	.98955	1.7	.00028
.27	.01520	439.2	.01515	438.4	.98910	1.6	.00024
.28	.01575	439.3	.01570	438.5	.98865	1.5	.00020
.29	.01630	439.4	.01625	438.6	.98820	1.4	.00016
3.30	1.10105	439.5	1.10103	438.7	9.99000	1.3	0.00018
.31	.01685	439.6	.01680	438.8	.98775	1.2	.00016
.32	.01740	439.7	.01735	438.9	.98730	1.1	.00014
.33	.01795	439.8	.01790	439.0	.98685	1.0	.00011
.34	.01850	439.9	.01845	439.1	.98640	0.9	.00007
3.35	1.15332	439.1	1.15340	438.1	9.99000	0.8	0.00007
.36	.01905	439.2	.01900	438.2	.98595	0.7	.00005
.37	.01960	439.3	.01955	438.3	.98550	0.6	.00001
.38	.02015	439.4	.02010	438.4	.98505	0.5	.00000
.39	.02070	439.5	.02065	438.5	.98460	0.4	.00000
3.40	1.17990	439.1	1.17993	438.1	9.99000	0.3	0.00002
.41	.02125	439.2	.02120	438.2	.98415	0.2	.00000
.42	.02180	439.3	.02175	438.3	.98370	0.1	.00000
.43	.02235	439.4	.02230	438.4	.98325	0.0	.00000
.44	.02290	439.5	.02285	438.5	.98280	0.0	.00000
3.45	1.19085	439.2	1.19072	438.1	9.99000	0.0	0.00000
.46	.02345	439.3	.02340	438.2	.98235	0.0	.00000
.47	.02400	439.4	.02395	438.3	.98190	0.0	.00000
.48	.02455	439.5	.02450	438.4	.98145	0.0	.00000
.49	.02510	439.6	.02505	438.5	.98100	0.0	.00000
3.50	1.21990	439.1	1.21990	438.1	9.99000	0.0	0.00000
u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_2'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_2'$	$\log \coth u$
3.50	1.24960	435.4	1.24940	435.5	0.00020	4.0	0.00020
.51	.22290		.22273		.00017		.00017
.52	.22731		.22707		.00014	1.5	.00014
.53	.23166	435.0	.23140		.00011		.00011
.54	.23601		.23574	435.0	.00007		.00007
3.55	1.24036	435.0	1.24107	435.0	0.00028	1.0	0.00072
.56	.24471		.24451		.00019		.00019
.57	.24906		.24875		.00013		.00013
.58	.25341		.25308		.00008	1.5	.00007
.59	.25776		.25742		.00004		.00006
3.60	1.25211	434.0	1.25275	434.0	0.00035	1.5	0.00065
.61	.25646		.25600		.00020		.00020
.62	.26080		.26043		.00015	1.2	.00012
.63	.26515		.26476		.00010		.00010
.64	.26950		.26910		.00006		.00006
3.65	1.26885	434.0	1.26844	435.7	0.00041	1.2	0.00059
.66	.27320		.27278		.00032		.00032
.67	.27755		.27711		.00024	1.1	.00026
.68	.28190	434.8	.28145		.00015		.00015
.69	.28625		.28579	435.8	.00009		.00014
3.70	1.26560	434.8	1.26612	435.8	0.00047	1.1	0.00053
.71	.29000		.28956		.00034	1.0	.00052
.72	.29440		.29396		.00024		.00051
.73	.29880		.29834		.00016		.00050
.74	.30320		.30274		.00009		.00049
3.75	1.26733	434.8	1.26781	434.8	0.00052	1.0	0.00048
.76	.30768		.30725		.00043	0.9	.00047
.77	.31203		.31160		.00034		.00046
.78	.31638	434.7	.31594		.00025		.00045
.79	.32073		.32027	434.0	.00016		.00044
3.80	1.26907	434.7	1.26951	435.0	0.00057	0.0	0.00043
.81	.32512		.32468		.00047		.00043
.82	.32947		.32898		.00038	0.8	.00042
.83	.33382		.33332		.00029		.00041
.84	.33817		.33766		.00020		.00040
3.85	1.27083	434.7	1.27129	434.0	0.00061	0.8	0.00039
.86	.34255		.34204		.00051		.00039
.87	.34690		.34638		.00042		.00038
.88	.35125		.35072		.00033	0.7	.00037
.89	.35560		.35506		.00024		.00036
3.90	1.27258	434.7	1.27303	434.0	0.00064	0.7	0.00036
.91	.36003		.35951		.00055		.00035
.92	.36438		.36384		.00046		.00034
.93	.36873		.36818		.00037		.00033
.94	.37308		.37252		.00028		
3.95	1.27427	434.6	1.27470	434.0	0.00068	0.6	0.00032
.96	.37742		.37685		.00058		.00032
.97	.38177		.38119		.00049		.00031
.98	.38612		.38553		.00040		.00030
.99	.39047		.38987		.00030		.00029
4.00	1.27600	434.6	1.27640	434.0	0.00071	0.6	0.00029
u	$\log \sinh u$	$= F_2'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_2'$	$\log \coth u$

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$\omega F_1'$	$\log \cosh u$	$\omega F_2'$	$\log \tanh u$	$\omega F_3'$	$\log \coth u$
4.00	1.43600	434.6	1.43620	434.6	0.00020	0.0	0.00020
.01	.43605		.43625		.00021		.00021
.02	.43610		.43630		.00022		.00022
.03	.43615		.43635		.00023	0.5	.00023
.04	.43620		.43640		.00024		.00024
4.05	1.43723	434.6	1.43743	434.6	0.00024	0.5	0.00024
.06	.43728		.43748		.00025		.00025
.07	.43733	434.5	.43753		.00025		.00025
.08	.43737		.43757		.00026		.00026
.09	.43742		.43762	434.4	.00026		.00026
4.10	1.43846	434.5	1.43866	434.4	0.00026	0.5	0.00026
.11	.43851		.43871		.00027		.00027
.12	.43856		.43876		.00027		.00027
.13	.43861		.43881		.00028	0.5	.00028
.14	.43866		.43886		.00028		.00028
4.15	1.43968	434.5	1.43988	434.4	0.00028	0.5	0.00028
.16	.43973		.43993		.00029		.00029
.17	.43978		.43998		.00029		.00029
.18	.43983		.44003		.00030		.00030
.19	.43988		.44008		.00030		.00030
4.20	1.44091	434.5	1.44111	434.4	0.00030	0.5	0.00030
.21	.44096		.44116		.00031		.00031
.22	.44101		.44121		.00031		.00031
.23	.44106		.44126		.00032		.00032
.24	.44111		.44131		.00032		.00032
4.25	1.44213	434.5	1.44233	434.4	0.00032	0.5	0.00032
.26	.44218		.44238		.00033	0.5	.00032
.27	.44223		.44243		.00033		.00032
.28	.44228		.44248		.00034		.00032
.29	.44233		.44253		.00034		.00032
4.30	1.44336	434.5	1.44356	434.4	0.00034	0.5	0.00032
.31	.44341		.44361		.00034		.00032
.32	.44346	434.4	.44366		.00035		.00033
.33	.44351		.44371		.00035		.00033
.34	.44356		.44376		.00035		.00033
4.35	1.44458	434.4	1.44478	434.4	0.00035	0.5	0.00033
.36	.44463		.44483	434.2	.00036		.00033
.37	.44468		.44488		.00036		.00033
.38	.44473		.44493		.00036		.00033
.39	.44478		.44498		.00037		.00033
4.40	1.44581	434.4	1.44601	434.4	0.00037	0.5	0.00033
.41	.44586		.44606		.00037		.00033
.42	.44591		.44611		.00038		.00033
.43	.44596		.44616		.00038	0.5	.00033
.44	.44601		.44621		.00038		.00033
4.45	1.44703	434.4	1.44723	434.2	0.00038	0.5	0.00033
.46	.44708		.44728		.00039		.00033
.47	.44713		.44733		.00039		.00033
.48	.44718		.44738		.00039		.00033
.49	.44723		.44743		.00040		.00033
4.50	1.44826	434.4	1.44846	434.2	0.00040	0.5	0.00033
u	$\log \tanh u$	$\omega F_1'$	$\log \coth u$	$\omega F_2'$	$\log \sinh u$	$\omega F_3'$	$\log \cosh u$

BRIDGMAN TABLE

Logarithms of Hyperbolic Functions.

u	log sinh u	= F ₁ '	log cosh u	= F ₂ '	log tanh u	= F ₃ '	log coth u
4.50	1.63124	434.4	1.65335	434.2	0.00080	0.2	0.00011
.51	.65739		.65769		.00080		.00011
.52	.66193		.66203		.00080		.00010
.53	.66627		.66637		.00080		.00010
.54	.67062		.67072		.00080		.00010
4.55	1.67495	434.4	1.67505	434.2	0.00080	0.2	0.00010
.56	.67931		.67940		.00080		.00010
.57	.68365		.68374		.00081		.00009
.58	.68799		.68808		.00081		.00009
.59	.69234		.69243		.00081		.00009
4.60	1.69668	434.4	1.69677	434.2	0.00081	0.2	0.00009
.61	.70102		.70111		.00081		.00009
.62	.70537		.70545		.00082		.00008
.63	.70971		.70979		.00082		.00008
.64	.71405		.71414		.00082		.00008
4.65	1.71840	434.4	1.71848	434.2	0.00082	0.2	0.00008
.66	.72274		.72282		.00082		.00008
.67	.72709		.72716		.00082		.00008
.68	.73143		.73151		.00083	0.1	.00007
.69	.73577		.73585		.00083		.00007
4.70	1.74012	434.4	1.74019	434.2	0.00083	0.1	0.00007
.71	.74445		.74453		.00083		.00007
.72	.74881		.74887		.00083		.00007
.73	.75315		.75322		.00083		.00007
.74	.75749		.75756		.00083		.00007
4.75	1.76184	434.4	1.76190	434.2	0.00083	0.1	0.00007
.76	.76618		.76624		.00084		.00006
.77	.77052		.77059		.00084		.00006
.78	.77487		.77493		.00084		.00006
.79	.77921		.77927		.00084		.00006
4.80	1.78355	434.4	1.78361	434.2	0.00084	0.1	0.00006
.81	.78790		.78796		.00084		.00006
.82	.79224		.79230		.00084		.00006
.83	.79658	434.3	.79664		.00084		.00006
.84	.80093		.80098		.00085		.00005
4.85	1.80527	434.3	1.80532	434.2	0.00085	0.1	0.00005
.86	.80962		.80967		.00085		.00005
.87	.81396		.81401		.00085		.00005
.88	.81830		.81835		.00085		.00005
.89	.82265		.82269		.00085		.00005
4.90	1.82699	434.3	1.82704	434.2	0.00085	0.1	0.00005
.91	.83133		.83138		.00085		.00005
.92	.83568		.83572		.00085		.00005
.93	.84002		.84006		.00085		.00005
.94	.84436		.84441	434.3	.00085		.00004
4.95	1.84871	434.3	1.84875	434.3	0.00085	0.1	0.00004
.96	.85305		.85309		.00085		.00004
.97	.85739		.85743		.00085		.00004
.98	.86174		.86178		.00085		.00004
.99	.86608		.86612		.00085		.00004
5.00	1.87042	434.3	1.87046	434.3	0.00085	0.1	0.00004
u	log tanh u	= F ₁ '	log coth u	= F ₂ '	log sinh u	= F ₃ '	log cosh u

Logarithms of Hyperbolic Functions.

u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$
5.00	1.87012	434.3	1.87096	434.3	0.00084	0.1	0.00084
.01	.87027		.87096		.00084		.00084
.02	.87041		.87105		.00084		.00084
.03	.87055		.87119		.00084		.00084
.04	.87069		.87133		.00084		.00084
5.05	1.87112	434.3	1.87207	434.3	0.00084	0.1	0.00084
.06	.87128		.87207		.00084		.00084
.07	.87143		.87222		.00084		.00084
.08	.87157		.87236		.00084		.00084
.09	.87171		.87250		.00084		.00084
5.10	1.87215	434.3	1.87310	434.3	0.00084	0.1	0.00084
.11	.87230		.87310		.00084		.00084
.12	.87244		.87324		.00084		.00084
.13	.87258		.87338		.00084		.00084
.14	.87272		.87352		.00084		.00084
5.15	1.87315	434.3	1.87410	434.3	0.00084	0.1	0.00084
.16	.87330		.87410		.00084		.00084
.17	.87344		.87424		.00084		.00084
.18	.87358		.87438		.00084		.00084
.19	.87372		.87452		.00084		.00084
5.20	1.87415	434.3	1.87510	434.3	0.00084	0.1	0.00084
.21	.87430		.87510		.00084		.00084
.22	.87444		.87524		.00084		.00084
.23	.87458		.87538		.00084		.00084
.24	.87472		.87552		.00084		.00084
5.25	1.87515	434.3	1.87610	434.3	0.00084	0.1	0.00084
.26	.87530		.87610		.00084		.00084
.27	.87544		.87624		.00084		.00084
.28	.87558		.87638		.00084		.00084
.29	.87572		.87652		.00084		.00084
5.30	1.87615	434.3	1.87710	434.3	0.00084	0.1	0.00084
.31	.87630		.87710		.00084		.00084
.32	.87644		.87724		.00084		.00084
.33	.87658		.87738		.00084		.00084
.34	.87672		.87752		.00084		.00084
5.35	1.87715	434.3	1.87810	434.3	0.00084	0.1	0.00084
.36	.87730		.87810		.00084		.00084
.37	.87744		.87824		.00084		.00084
.38	.87758		.87838		.00084		.00084
.39	.87772		.87852		.00084		.00084
5.40	1.87815	434.3	1.87910	434.3	0.00084	0.1	0.00084
.41	.87830		.87910		.00084		.00084
.42	.87844		.87924		.00084		.00084
.43	.87858		.87938		.00084		.00084
.44	.87872		.87952		.00084		.00084
5.45	1.87915	434.3	1.88010	434.3	0.00084	0.1	0.00084
.46	.87930		.88010		.00084		.00084
.47	.87944		.88024		.00084		.00084
.48	.87958		.88038		.00084		.00084
.49	.87972		.88052		.00084		.00084
5.50	1.88015	434.3	1.88110	434.3	0.00084	0.1	0.00084
u	$\log \sinh u$	$= F_1'$	$\log \cosh u$	$= F_2'$	$\log \tanh u$	$= F_3'$	$\log \coth u$

SMITHSONIAN TABLES

Logarithms of Hyperbolic Functions.

u	log sinh u	= F'	log cosh u	= F'	log tanh u	= F'	log coth u
5.50	2.08758	434.3	2.08760	434.3	9.99999	0.0	0.00001
.51	.09193		.09194		.99999		.00001
.52	.09527		.09528		.99999		.00001
.53	.09861		.09863		.99999		.00001
.54	.10195		.10197		.99999		.00001
5.55	2.10910	434.3	2.10911	434.3	9.99999	0.0	0.00001
.56	.11304		.11305		.99999		.00001
.57	.11798		.11800		.99999		.00001
.58	.12293		.12294		.99999		.00001
.59	.12607		.12608		.99999		.00001
5.60	2.13101	434.3	2.13103	434.3	9.99999	0.0	0.00001
.61	.13536		.13537		.99999		.00001
.62	.13970		.13971		.99999		.00001
.63	.14404		.14405		.99999		.00001
.64	.14839		.14840		.99999		.00001
5.65	2.15271	434.3	2.15274	434.3	9.99999	0.0	0.00001
.66	.15707		.15708		.99999		.00001
.67	.16141		.16142		.99999		.00001
.68	.16576		.16577		.99999		.00001
.69	.17010		.17011		.99999		.00001
5.70	2.17444	434.3	2.17445	434.3	9.99999	0.0	0.00001
.71	.17879		.17880		.99999		.00001
.72	.18313		.18314		.99999		.00001
.73	.18747		.18748		.99999		.00001
.74	.19182		.19182		.99999		.00001
5.75	2.19516	434.3	2.19517	434.3	9.99999	0.0	0.00001
.76	.20050		.20051		.99999		.00001
.77	.20484		.20485		.99999		.00001
.78	.20919		.20920		.99999		.00001
.79	.21353		.21354		.99999		.00001
5.80	2.21787	434.3	2.21788	434.3	9.99999	0.0	0.00001
.81	.22222		.22222		.99999		.00001
.82	.22656		.22657		.99999		.00001
.83	.23090		.23091		.99999		.00001
.84	.23525		.23525		.99999		.00001
5.85	2.23959	434.3	2.23960	434.3	9.99999	0.0	0.00001
.86	.24393		.24394		.99999		.00001
.87	.24828		.24828		.99999		.00001
.88	.25262		.25262		.99999		.00001
.89	.25696		.25697		.99999		.00001
5.90	2.26130	434.3	2.26131	434.3	9.99999	0.0	0.00001
.91	.26565		.26565		.99999		.00001
.92	.26999		.26999		.99999		.00001
.93	.27433		.27434		.99999		.00001
.94	.27868		.27868		.99999		.00001
5.95	2.28302	434.3	2.28303	434.3	9.99999	0.0	0.00001
.96	.28736		.28737		.99999		.00001
.97	.29171		.29171		.99999		.00001
.98	.29605		.29605		.99999		.00001
.99	.30039		.30040		.99999		.00001
6.00	2.30473	434.3	2.30474	434.3	9.99999	0.0	0.00001
u	log tan gd u	= F'	log sec gd u	= F'	log sin gd u	= F'	log cos gd u

SMITHSONIAN TABLE

TABLE II

NATURAL HYPERBOLIC FUNCTIONS

Natural Hyperbolic Functions.

u	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$	$\tanh u$	$= F_3'$	$\coth u$	$= F_4'$
0.0050	0.00500	10,0	1.00001	0,1	0.00500	10,0	200.00	400,0
.0051	.00510		.00001		.00510		196.08	384.5
.0052	.00520		.00001		.00520		192.31	369.8
.0053	.00530		.00001		.00530		188.68	356.0
.0054	.00540		.00001		.00540		185.19	342.0
0.0055	0.00550	10,0	1.00002	0,1	0.00550	10,0	181.82	330.6
.0056	.00560		.00002		.00560		178.57	318.0
.0057	.00570		.00002		.00570		175.44	307.8
.0058	.00580		.00002		.00580		172.42	297.3
.0059	.00590		.00002		.00590		169.49	287.3
0.0060	0.00600	10,0	1.00002	0,1	0.00600	10,0	166.67	277.8
.0061	.00610		.00002		.00610		163.94	268.7
.0062	.00620		.00002		.00620		161.30	260.1
.0063	.00630		.00002		.00630		158.73	251.0
.0064	.00640		.00002		.00640		156.25	244.1
0.0065	0.00650	10,0	1.00002	0,1	0.00650	10,0	153.85	236.7
.0066	.00660		.00002		.00660		151.52	229.6
.0067	.00670		.00002		.00670		149.26	222.8
.0068	.00680		.00002		.00680		147.06	216.3
.0069	.00690		.00002		.00690		144.93	210.0
0.0070	0.00700	10,0	1.00002	0,1	0.00700	10,0	142.86	204.1
.0071	.00710		.00003		.00710		140.85	198.4
.0072	.00720		.00003		.00720		138.89	192.6
.0073	.00730		.00003		.00730		136.99	187.6
.0074	.00740		.00003		.00740		135.14	182.6
0.0075	0.00750	10,0	1.00003	0,1	0.00750	10,0	133.34	177.8
.0076	.00760		.00003		.00760		131.58	173.1
.0077	.00770		.00003		.00770		129.87	168.7
.0078	.00780		.00003		.00780		128.21	164.4
.0079	.00790		.00003		.00790		126.58	160.2
0.0080	0.00800	10,0	1.00003	0,1	0.00800	10,0	125.00	156.2
.0081	.00810		.00003		.00810		123.46	152.4
.0082	.00820		.00003		.00820		121.95	148.7
.0083	.00830		.00003		.00830		120.48	145.2
.0084	.00840		.00004		.00840		119.05	141.7
0.0085	0.00850	10,0	1.00004	0,1	0.00850	10,0	117.65	138.4
.0086	.00860		.00004		.00860		116.28	135.2
.0087	.00870		.00004		.00870		114.95	132.1
.0088	.00880		.00004		.00880		113.64	129.1
.0089	.00890		.00004		.00890		112.36	126.2
0.0090	0.00900	10,0	1.00004	0,1	0.00900	10,0	111.11	123.5
.0091	.00910		.00004		.00910		109.89	120.8
.0092	.00920		.00004		.00920		108.70	118.1
.0093	.00930		.00004		.00930		107.53	115.6
.0094	.00940		.00004		.00940		106.39	113.2
0.0095	0.00950	10,0	1.00005	0,1	0.00950	10,0	105.27	110.8
.0096	.00960		.00005		.00960		104.17	108.5
.0097	.00970		.00005		.00970		103.10	106.3
.0098	.00980		.00005		.00980		102.04	104.1
.0099	.00990		.00005		.00990		101.01	102.0
0.0100	0.01000	10,0	1.00005	0,1	0.01000	10,0	100.00	100,0
u	$\tan gd u$	$= F_1'$	$\sec gd u$	$= F_2'$	$\sin gd u$	$= F_3'$	$\csc gd u$	$= F_4'$

Natural Hyperbolic Functions.

u	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$
0.0100	0.01000	10,0	1.00005	0,1	0.01000	10,0	100,003	1000,0
.0101	.01009		.00005		.01001		99,003	980,1
.0102	.01008		.00005		.01002		98,003	961,1
.0103	.01007		.00005		.01003		97,003	942,0
.0104	.01006		.00005		.01004		96,003	923,5
0.0105	0.01005	10,0	1.00006	0,1	0.01005	10,0	95,003	905,0
.0106	.01004		.00006		.01006		94,003	886,0
.0107	.01003		.00006		.01007		93,003	867,5
.0108	.01002		.00006		.01008		92,003	849,1
.0109	.01001		.00006		.01009		91,003	831,0
0.0110	0.01100	10,0	1.00006	0,1	0.01100	10,0	90,003	812,6
.0111	.01100		.00006		.01101		89,003	794,4
.0112	.01100		.00006		.01102		88,003	776,2
.0113	.01100		.00006		.01103		87,003	758,1
.0114	.01100		.00006		.01104		86,003	740,0
0.0115	0.01150	10,0	1.00007	0,1	0.01150	10,0	85,003	721,9
.0116	.01150		.00007		.01151		84,003	703,8
.0117	.01150		.00007		.01152		83,003	685,7
.0118	.01150		.00007		.01153		82,003	667,6
.0119	.01150		.00007		.01154		81,003	649,5
0.0120	0.01200	10,0	1.00007	0,1	0.01200	10,0	80,003	631,4
.0121	.01200		.00007		.01201		79,003	613,3
.0122	.01200		.00007		.01202		78,003	595,2
.0123	.01200		.00008		.01203		77,003	577,1
.0124	.01200		.00008		.01204		76,003	559,0
0.0125	0.01250	10,0	1.00008	0,1	0.01250	10,0	75,003	540,9
.0126	.01250		.00008		.01251		74,003	522,8
.0127	.01250		.00008		.01252		73,003	504,7
.0128	.01250		.00008		.01253		72,003	486,6
.0129	.01250		.00008		.01254		71,003	468,5
0.0130	0.01300	10,0	1.00008	0,1	0.01300	10,0	70,003	450,4
.0131	.01300		.00009		.01301		69,003	432,3
.0132	.01300		.00009		.01302		68,003	414,2
.0133	.01300		.00009		.01303		67,003	396,1
.0134	.01300		.00009		.01304		66,003	378,0
0.0135	0.01350	10,0	1.00009	0,1	0.01350	10,0	65,003	359,9
.0136	.01350		.00009		.01351		64,003	341,8
.0137	.01350		.00009		.01352		63,003	323,7
.0138	.01350		.00010		.01353		62,003	305,6
.0139	.01350		.00010		.01354		61,003	287,5
0.0140	0.01400	10,0	1.00010	0,1	0.01400	10,0	60,003	269,4
.0141	.01400		.00010		.01401		59,003	251,3
.0142	.01400		.00010		.01402		58,003	233,2
.0143	.01400		.00010		.01403		57,003	215,1
.0144	.01400		.00010		.01404		56,003	197,0
0.0145	0.01450	10,0	1.00011	0,1	0.01450	10,0	55,003	178,9
.0146	.01450		.00011		.01451		54,003	160,8
.0147	.01450		.00011		.01452		53,003	142,7
.0148	.01450		.00011		.01453		52,003	124,6
.0149	.01450		.00011		.01454		51,003	106,5
0.0150	0.01500	10,0	1.00011	0,2	0.01500	10,0	50,003	88,4
u	$\tanh u$	$= F_1'$	$\operatorname{sech} u$	$= F_2'$	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$

SMITHSONIAN TABLES

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
0.0150	0.01500	10.0	1.00011	0.2	0.01500	10.0	66.672	444.4
.0151	.01510		.00011		.01510		66.230	438.5
.0152	.01520		.00012		.01520		65.795	432.8
.0153	.01530		.00012		.01530		65.365	427.2
.0154	.01540		.00012		.01540		64.940	421.6
0.0155	0.01550	10.0	1.00012	0.2	0.01550	10.0	64.521	416.2
.0156	.01560		.00012		.01560		64.108	410.9
.0157	.01570		.00012		.01570		63.699	405.7
.0158	.01580		.00012		.01580		63.296	400.5
.0159	.01590		.00013		.01590		62.898	395.5
0.0160	0.01600	10.0	1.00013	0.2	0.01600	10.0	62.505	390.6
.0161	.01610		.00013		.01610		62.117	385.8
.0162	.01620		.00013		.01620		61.734	381.0
.0163	.01630		.00013		.01630		61.355	376.3
.0164	.01640		.00013		.01640		60.981	371.8
0.0165	0.01650	10.0	1.00014	0.2	0.01650	10.0	60.612	367.3
.0166	.01660		.00014		.01660		60.247	362.9
.0167	.01670		.00014		.01670		59.886	358.5
.0168	.01680		.00014		.01680		59.529	354.3
.0169	.01690		.00014		.01690		59.177	350.1
0.0170	0.01700	10.0	1.00014	0.2	0.01700	10.0	58.829	346.0
.0171	.01710		.00015		.01710		58.485	342.0
.0172	.01720		.00015		.01720		58.145	338.0
.0173	.01730		.00015		.01730		57.809	334.1
.0174	.01740		.00015		.01740		57.477	330.3
0.0175	0.01750	10.0	1.00015	0.2	0.01750	10.0	57.149	326.5
.0176	.01760		.00015		.01760		56.824	322.8
.0177	.01770		.00016		.01770		56.503	319.2
.0178	.01780		.00016		.01780		56.186	315.6
.0179	.01790		.00016		.01790		55.872	312.1
0.0180	0.01800	10.0	1.00016	0.2	0.01800	10.0	55.562	308.6
.0181	.01810		.00016		.01810		55.255	305.2
.0182	.01820		.00017		.01820		54.951	301.9
.0183	.01830		.00017		.01830		54.651	298.6
.0184	.01840		.00017		.01840		54.354	295.3
0.0185	0.01850	10.0	1.00017	0.2	0.01850	10.0	54.060	292.2
.0186	.01860		.00017		.01860		53.770	289.0
.0187	.01870		.00017		.01870		53.484	285.9
.0188	.01880		.00018		.01880		53.198	282.9
.0189	.01890		.00018		.01890		52.916	279.9
0.0190	0.01900	10.0	1.00018	0.2	0.01900	10.0	52.638	277.0
.0191	.01910		.00018		.01910		52.362	274.1
.0192	.01920		.00018		.01920		52.090	271.2
.0193	.01930		.00019		.01930		51.820	268.4
.0194	.01940		.00019		.01940		51.553	265.7
0.0195	0.01950	10.0	1.00019	0.2	0.01950	10.0	51.289	263.0
.0196	.01960		.00019		.01960		51.027	260.3
.0197	.01970		.00019		.01970		50.768	257.7
.0198	.01980		.00020		.01980		50.512	255.2
.0199	.01990		.00020		.01990		50.258	252.5
0.0200	0.02000	10.0	1.00020	0.2	0.02000	10.0	50.007	250.0
u	tan gd u	= F ₁ '	sec gd u	= F ₂ '	sin gd u	= F ₃ '	cos gd u	= F ₄ '

Natural Hyperbolic Functions.

x	$\sinh x$	$= F_1'$	$\cosh x$	$= F_2'$	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$
0.0000	0.00000	10.00	1.00000	0.1	0.00000	10.00	30.000	1.0000
.0001	.00010		.00010		.00010		.00010	
.0002	.00020		.00020		.00020		.00020	
.0003	.00030		.00030		.00030		.00030	
.0004	.00040		.00040		.00040		.00040	
0.0005	0.00050	10.00	1.00050	0.2	0.00050	10.00	.00050	.00050
.0006	.00060		.00060		.00060		.00060	
.0007	.00070		.00070		.00070		.00070	
.0008	.00080		.00080		.00080		.00080	
.0009	.00090		.00090		.00090		.00090	
0.0010	0.00100	10.00	1.00100	0.3	0.00100	10.00	.00100	.00100
.0011	.00110		.00110		.00110		.00110	
.0012	.00120		.00120		.00120		.00120	
.0013	.00130		.00130		.00130		.00130	
.0014	.00140		.00140		.00140		.00140	
0.0015	0.00150	10.00	1.00150	0.4	0.00150	10.00	.00150	.00150
.0016	.00160		.00160		.00160		.00160	
.0017	.00170		.00170		.00170		.00170	
.0018	.00180		.00180		.00180		.00180	
.0019	.00190		.00190		.00190		.00190	
0.0020	0.00200	10.00	1.00200	0.5	0.00200	10.00	.00200	.00200
.0021	.00210		.00210		.00210		.00210	
.0022	.00220		.00220		.00220		.00220	
.0023	.00230		.00230		.00230		.00230	
.0024	.00240		.00240		.00240		.00240	
0.0025	0.00250	10.00	1.00250	0.6	0.00250	10.00	.00250	.00250
.0026	.00260		.00260		.00260		.00260	
.0027	.00270		.00270		.00270		.00270	
.0028	.00280		.00280		.00280		.00280	
.0029	.00290		.00290		.00290		.00290	
0.0030	0.00300	10.00	1.00300	0.7	0.00300	10.00	.00300	.00300
.0031	.00310		.00310		.00310		.00310	
.0032	.00320		.00320		.00320		.00320	
.0033	.00330		.00330		.00330		.00330	
.0034	.00340		.00340		.00340		.00340	
0.0035	0.00350	10.00	1.00350	0.8	0.00350	10.00	.00350	.00350
.0036	.00360		.00360		.00360		.00360	
.0037	.00370		.00370		.00370		.00370	
.0038	.00380		.00380		.00380		.00380	
.0039	.00390		.00390		.00390		.00390	
0.0040	0.00400	10.00	1.00400	0.9	0.00400	10.00	.00400	.00400
.0041	.00410		.00410		.00410		.00410	
.0042	.00420		.00420		.00420		.00420	
.0043	.00430		.00430		.00430		.00430	
.0044	.00440		.00440		.00440		.00440	
0.0045	0.00450	10.00	1.00450	1.0	0.00450	10.00	.00450	.00450
.0046	.00460		.00460		.00460		.00460	
.0047	.00470		.00470		.00470		.00470	
.0048	.00480		.00480		.00480		.00480	
.0049	.00490		.00490		.00490		.00490	
0.0050	0.00500	10.00	1.00500	0.1	0.00500	10.00	.00500	.00500
.0051	.00510		.00510		.00510		.00510	
.0052	.00520		.00520		.00520		.00520	
.0053	.00530		.00530		.00530		.00530	
.0054	.00540		.00540		.00540		.00540	
0.0055	0.00550	10.00	1.00550	0.2	0.00550	10.00	.00550	.00550
.0056	.00560		.00560		.00560		.00560	
.0057	.00570		.00570		.00570		.00570	
.0058	.00580		.00580		.00580		.00580	
.0059	.00590		.00590		.00590		.00590	
0.0060	0.00600	10.00	1.00600	0.3	0.00600	10.00	.00600	.00600
.0061	.00610		.00610		.00610		.00610	
.0062	.00620		.00620		.00620		.00620	
.0063	.00630		.00630		.00630		.00630	
.0064	.00640		.00640		.00640		.00640	
0.0065	0.00650	10.00	1.00650	0.4	0.00650	10.00	.00650	.00650
.0066	.00660		.00660		.00660		.00660	
.0067	.00670		.00670		.00670		.00670	
.0068	.00680		.00680		.00680		.00680	
.0069	.00690		.00690		.00690		.00690	
0.0070	0.00700	10.00	1.00700	0.5	0.00700	10.00	.00700	.00700
.0071	.00710		.00710		.00710		.00710	
.0072	.00720		.00720		.00720		.00720	
.0073	.00730		.00730		.00730		.00730	
.0074	.00740		.00740		.00740		.00740	
0.0075	0.00750	10.00	1.00750	0.6	0.00750	10.00	.00750	.00750
.0076	.00760		.00760		.00760		.00760	
.0077	.00770		.00770		.00770		.00770	
.0078	.00780		.00780		.00780		.00780	
.0079	.00790		.00790		.00790		.00790	
0.0080	0.00800	10.00	1.00800	0.7	0.00800	10.00	.00800	.00800
.0081	.00810		.00810		.00810		.00810	
.0082	.00820		.00820		.00820		.00820	
.0083	.00830		.00830		.00830		.00830	
.0084	.00840		.00840		.00840		.00840	
0.0085	0.00850	10.00	1.00850	0.8	0.00850	10.00	.00850	.00850
.0086	.00860		.00860		.00860		.00860	
.0087	.00870		.00870		.00870		.00870	
.0088	.00880		.00880		.00880		.00880	
.0089	.00890		.00890		.00890		.00890	
0.0090	0.00900	10.00	1.00900	0.9	0.00900	10.00	.00900	.00900
.0091	.00910		.00910		.00910		.00910	
.0092	.00920		.00920		.00920		.00920	
.0093	.00930		.00930		.00930		.00930	
.0094	.00940		.00940		.00940		.00940	
0.0095	0.00950	10.00	1.00950	1.0	0.00950	10.00	.00950	.00950
.0096	.00960		.00960		.00960		.00960	
.0097	.00970		.00970		.00970		.00970	
.0098	.00980		.00980		.00980		.00980	
.0099	.00990		.00990		.00990		.00990	
1	1.00000		1.00000		1.00000		1.00000	
x	$\sinh x$	$= F_1'$	$\cosh x$	$= F_2'$	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$

SMITHSONIAN TABLES

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
0.0250	0.02500	10.0	1.00031	0.3	0.02499	10.0	40.008	160.0
.0251	.02510		.00032		.02500		39.849	158.7
.0252	.02520		.00034		.02510		39.691	157.4
.0253	.02530		.00035		.02520		39.534	156.2
.0254	.02540		.00037		.02530		39.379	155.0
0.0255	0.02550	10.0	1.00033	0.3	0.02549	10.0	39.224	153.8
.0257	.02570		.00033		.02559		39.071	152.6
.0257	.02570		.00033		.02569		38.919	151.4
.0258	.02580		.00033		.02579		38.768	150.2
.0259	.02590		.00034		.02589		38.619	149.0
0.0260	0.02600	10.0	1.00034	0.3	0.02599	10.0	38.470	147.9
.0261	.02610		.00034		.02609		38.323	146.8
.0262	.02620		.00034		.02619		38.177	145.7
.0263	.02630		.00035		.02629		38.032	144.5
.0264	.02640		.00035		.02639		37.888	143.4
0.0265	0.02650	10.0	1.00035	0.3	0.02649	10.0	37.745	142.4
.0266	.02660		.00035		.02659		37.603	141.3
.0267	.02670		.00036		.02669		37.462	140.2
.0268	.02680		.00036		.02679		37.322	139.2
.0269	.02690		.00036		.02689		37.184	138.2
0.0270	0.02700	10.0	1.00036	0.3	0.02699	10.0	37.046	137.1
.0271	.02710		.00037		.02709		36.909	136.1
.0272	.02720		.00037		.02719		36.774	135.1
.0273	.02730		.00037		.02729		36.639	134.1
.0274	.02740		.00038		.02739		36.505	133.2
0.0275	0.02750	10.0	1.00038	0.3	0.02749	10.0	36.373	132.2
.0276	.02760		.00038		.02759		36.241	131.2
.0277	.02770		.00038		.02769		36.110	130.3
.0278	.02780		.00039		.02779		35.980	129.4
.0279	.02790		.00039		.02789		35.852	128.4
0.0280	0.02800	10.0	1.00039	0.3	0.02799	10.0	35.724	127.5
.0281	.02810		.00039		.02809		35.597	126.6
.0282	.02820		.00040		.02819		35.470	125.7
.0283	.02830		.00040		.02829		35.345	124.8
.0284	.02840		.00040		.02839		35.221	124.0
0.0285	0.02850	10.0	1.00041	0.3	0.02849	10.0	35.097	123.2
.0286	.02860		.00041		.02859		34.975	122.2
.0287	.02870		.00041		.02869		34.853	121.4
.0288	.02880		.00041		.02879		34.732	120.5
.0289	.02890		.00042		.02889		34.612	119.7
0.0290	0.02900	10.0	1.00042	0.3	0.02899	10.0	34.492	118.9
.0291	.02910		.00042		.02909		34.374	118.1
.0292	.02920		.00043		.02919		34.256	117.2
.0293	.02930		.00043		.02929		34.139	116.4
.0294	.02940		.00043		.02939		34.023	115.7
0.0295	0.02950	10.0	1.00044	0.3	0.02949	10.0	33.908	114.9
.0296	.02960		.00044		.02959		33.794	114.1
.0297	.02970		.00044		.02969		33.680	113.3
.0298	.02980		.00044		.02979		33.567	112.6
.0299	.02990		.00045		.02989		33.455	111.8
0.0300	0.03000	10.0	1.00045	0.3	0.02999	10.0	33.343	111.1
u	tan gd u	= F ₁ '	sec gd u	= F ₂ '	sin gd u	= F ₃ '	csc gd u	= F ₄ '

Natural Hyperbolic Functions.

u	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$	$\tanh u$	$= F_3'$	$\coth u$	$= F_4'$
0.0300	0.030000	100	1.00035	0.3	0.029991	100	33.313	111.1
0.0301	0.030100		1.00035		0.029991		33.253	110.3
0.0302	0.030200		1.00036		0.029991		33.193	109.5
0.0303	0.030300		1.00036		0.029991		33.133	108.7
0.0304	0.030400		1.00036		0.029991		33.073	107.9
0.0305	0.030500	100	1.00037	0.3	0.029991	100	32.913	107.1
0.0306	0.030600		1.00037		0.029991		32.853	106.3
0.0307	0.030700		1.00037		0.029991		32.793	105.5
0.0308	0.030800		1.00037		0.029991		32.733	104.7
0.0309	0.030900		1.00038		0.029991		32.673	103.9
0.0310	0.031000	100	1.00038	0.3	0.029991	100	32.613	103.1
0.0311	0.031100		1.00038		0.029991		32.553	102.3
0.0312	0.031200		1.00039		0.029991		32.493	101.5
0.0313	0.031300		1.00039		0.029991		32.433	100.7
0.0314	0.031400		1.00039		0.029991		32.373	99.9
0.0315	0.031500	100	1.00039	0.3	0.029991	100	32.313	99.1
0.0316	0.031600		1.00039		0.029991		32.253	98.3
0.0317	0.031700		1.00040		0.029991		32.193	97.5
0.0318	0.031800		1.00040		0.029991		32.133	96.7
0.0319	0.031900		1.00040		0.029991		32.073	95.9
0.0320	0.032000	100	1.00041	0.3	0.029991	100	32.013	95.1
0.0321	0.032100		1.00041		0.029991		31.953	94.3
0.0322	0.032200		1.00041		0.029991		31.893	93.5
0.0323	0.032300		1.00041		0.029991		31.833	92.7
0.0324	0.032400		1.00042		0.029991		31.773	91.9
0.0325	0.032500	100	1.00042	0.3	0.029991	100	31.713	91.1
0.0326	0.032600		1.00042		0.029991		31.653	90.3
0.0327	0.032700		1.00042		0.029991		31.593	89.5
0.0328	0.032800		1.00043		0.029991		31.533	88.7
0.0329	0.032900		1.00043		0.029991		31.473	87.9
0.0330	0.033000	100	1.00043	0.3	0.029991	100	31.413	87.1
0.0331	0.033100		1.00043		0.029991		31.353	86.3
0.0332	0.033200		1.00043		0.029991		31.293	85.5
0.0333	0.033300		1.00043		0.029991		31.233	84.7
0.0334	0.033400		1.00044		0.029991		31.173	83.9
0.0335	0.033500	100	1.00044	0.3	0.029991	100	31.113	83.1
0.0336	0.033600		1.00044		0.029991		31.053	82.3
0.0337	0.033700		1.00044		0.029991		30.993	81.5
0.0338	0.033800		1.00045		0.029991		30.933	80.7
0.0339	0.033900		1.00045		0.029991		30.873	79.9
0.0340	0.034000	100	1.00045	0.3	0.029991	100	30.813	79.1
0.0341	0.034100		1.00045		0.029991		30.753	78.3
0.0342	0.034200		1.00045		0.029991		30.693	77.5
0.0343	0.034300		1.00046		0.029991		30.633	76.7
0.0344	0.034400		1.00046		0.029991		30.573	75.9
0.0345	0.034500	100	1.00046	0.3	0.029991	100	30.513	75.1
0.0346	0.034600		1.00046		0.029991		30.453	74.3
0.0347	0.034700		1.00046		0.029991		30.393	73.5
0.0348	0.034800		1.00047		0.029991		30.333	72.7
0.0349	0.034900		1.00047		0.029991		30.273	71.9
0.0350	0.035000	100	1.00047	0.3	0.029991	100	30.213	71.1
u	$\tanh u$	$= F_1'$	$\cosh u$	$= F_2'$	$\sinh u$	$= F_3'$	$\coth u$	$= F_4'$

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
0.0350 .0351 .0352 .0353 .0354	0.03501 .03511 .03521 .03531 .03541	10.0	1.00061 .00062 .00062 .00062 .00063	0.4	0.03499 .03509 .03519 .03529 .03539	10.0	28.583 28.592 28.601 28.610 28.619	81.6 81.7 81.8 81.9 82.0
0.0355 .0356 .0357 .0358 .0359	0.03551 .03561 .03571 .03581 .03591	10.0	1.00063 .00063 .00064 .00064 .00064	0.4	0.03549 .03558 .03568 .03578 .03588	10.0	28.181 28.192 28.203 28.213 28.224	79.3 79.4 79.5 79.6 79.7
0.0360 .0361 .0362 .0363 .0364	0.03601 .03611 .03621 .03631 .03641	10.0	1.00065 .00065 .00066 .00066 .00066	0.4	0.03698 .03708 .03718 .03728 .03738	10.0	27.790 27.711 27.630 27.550 27.485	77.1 77.2 77.3 77.4 77.5
0.0365 .0366 .0367 .0368 .0369	0.03651 .03661 .03671 .03681 .03691	10.0	1.00067 .00067 .00067 .00068 .00068	0.4	0.03848 .03858 .03868 .03878 .03888	10.0	27.490 27.315 27.240 27.165 27.113	75.0 74.6 74.3 73.8 73.4
0.0370 .0371 .0372 .0373 .0374	0.03701 .03711 .03721 .03731 .03741	10.0	1.00068 .00069 .00069 .00070 .00070	0.4	0.03998 .04008 .04018 .04028 .04038	10.0	27.039 26.967 26.894 26.822 26.759	73.0 72.6 72.2 71.8 71.5
0.0375 .0376 .0377 .0378 .0379	0.03751 .03761 .03771 .03781 .03791	10.0	1.00070 .00071 .00071 .00072 .00072	0.4	0.03748 .03758 .03768 .03778 .03788	10.0	26.690 26.608 26.538 26.468 26.398	71.1 70.7 70.3 70.0 69.6
0.0380 .0381 .0382 .0383 .0384	0.03801 .03811 .03821 .03831 .03841	10.0	1.00072 .00073 .00073 .00073 .00074	0.4	0.03998 .04008 .04018 .04028 .04038	10.0	26.328 26.239 26.151 26.122 26.054	69.3 68.9 68.5 68.1 67.8
0.0385 .0386 .0387 .0388 .0389	0.03851 .03861 .03871 .03881 .03891	10.0	1.00074 .00075 .00075 .00075 .00076	0.4	0.03848 .03858 .03868 .03878 .03888	10.0	25.987 25.920 25.853 25.786 25.720	67.4 67.1 66.7 66.4 66.1
0.0390 .0391 .0392 .0393 .0394	0.03901 .03911 .03921 .03931 .03941	10.0	1.00076 .00076 .00077 .00077 .00078	0.4	0.03998 .04008 .04018 .04028 .04038	10.0	25.654 25.588 25.523 25.458 25.394	65.7 65.4 65.0 64.7 64.4
0.0395 .0396 .0397 .0398 .0399	0.03951 .03961 .03971 .03981 .03991	10.0	1.00078 .00078 .00079 .00079 .00080	0.4	0.03948 .03958 .03968 .03978 .03988	10.0	25.330 25.266 25.202 25.139 25.076	64.1 63.7 63.4 63.1 62.8
0.0400	0.04001	10.0	1.00080	0.4	0.04098	10.0	25.013	62.5
u	tanh u	= F ₁ '	coth u	= F ₂ '	sinh u	= F ₃ '	cosh u	= F ₄ '

SMITHSONIAN TABLES

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
0.0000	0.00001	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0010	0.00101	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0020	0.00201	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0030	0.00301	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0040	0.00401	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0050	0.00501	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0060	0.00601	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0070	0.00701	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0080	0.00801	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0090	0.00901	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0100	0.01101	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0110	0.01111	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0120	0.01121	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0130	0.01131	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0140	0.01141	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0150	0.01151	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0160	0.01161	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0170	0.01171	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0180	0.01181	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0190	0.01191	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0200	0.01201	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0210	0.01211	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0220	0.01221	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0230	0.01231	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0240	0.01241	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0250	0.01251	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0260	0.01261	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0270	0.01271	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0280	0.01281	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0290	0.01291	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0300	0.01301	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0310	0.01311	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0320	0.01321	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0330	0.01331	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0340	0.01341	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0350	0.01351	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0360	0.01361	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0370	0.01371	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0380	0.01381	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0390	0.01391	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0400	0.01401	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0410	0.01411	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0420	0.01421	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0430	0.01431	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0440	0.01441	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0450	0.01451	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0460	0.01461	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0470	0.01471	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0480	0.01481	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0490	0.01491	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
0.0500	0.01501	10.0	1.00000	0.1	0.00000	10.0	25.000	0.05
u	tan gd u	= F ₁ '	sec gd u	= F ₂ '	sin gd u	= F ₃ '	cos gd u	= F ₄ '

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
0.0150	0.01502	10.0	1.00101	0.5	0.01507	10.0	22.277	49.3
0.0151	0.01512		0.00102		0.01509		22.188	49.1
0.0152	0.01512		0.00102		0.01517		22.139	48.9
0.0153	0.01512		0.00103		0.01527		22.090	48.7
0.0154	0.01512		0.00103		0.01537		22.042	48.5
0.0155	0.01552	10.0	1.00104	0.5	0.01547	10.0	21.993	48.3
0.0156	0.01562		0.00104		0.01557		21.945	48.1
0.0157	0.01572		0.00104		0.01567		21.897	47.8
0.0158	0.01582		0.00105		0.01577		21.849	47.6
0.0159	0.01592		0.00105		0.01587		21.802	47.4
0.0160	0.01602	10.0	1.00106	0.5	0.01597	10.0	21.754	47.2
0.0161	0.01612		0.00106		0.01607		21.707	47.0
0.0162	0.01612		0.00107		0.01617		21.660	46.8
0.0163	0.01612		0.00107		0.01627		21.614	46.6
0.0164	0.01612		0.00108		0.01637		21.567	46.4
0.0165	0.01652	10.0	1.00108	0.5	0.01647	10.0	21.521	46.2
0.0166	0.01662		0.00109		0.01657		21.475	46.0
0.0167	0.01672		0.00109		0.01667		21.429	45.8
0.0168	0.01682		0.00110		0.01677		21.383	45.6
0.0169	0.01692		0.00110		0.01687		21.338	45.4
0.0170	0.01702	10.0	1.00110	0.5	0.01697	10.0	21.292	45.2
0.0171	0.01712		0.00111		0.01707		21.247	45.0
0.0172	0.01722		0.00111		0.01716		21.202	44.9
0.0173	0.01732		0.00112		0.01726		21.157	44.7
0.0174	0.01742		0.00112		0.01736		21.113	44.5
0.0175	0.01752	10.0	1.00113	0.5	0.01746	10.0	21.068	44.3
0.0176	0.01762		0.00113		0.01756		21.024	44.1
0.0177	0.01772		0.00114		0.01766		20.980	43.9
0.0178	0.01782		0.00114		0.01776		20.936	43.7
0.0179	0.01792		0.00115		0.01786		20.893	43.6
0.0180	0.01802	10.0	1.00115	0.5	0.01796	10.0	20.849	43.4
0.0181	0.01812		0.00116		0.01806		20.806	43.2
0.0182	0.01822		0.00116		0.01816		20.763	43.0
0.0183	0.01832		0.00117		0.01826		20.720	42.8
0.0184	0.01842		0.00117		0.01836		20.677	42.7
0.0185	0.01852	10.0	1.00118	0.5	0.01846	10.0	20.635	42.5
0.0186	0.01862		0.00118		0.01856		20.592	42.3
0.0187	0.01872		0.00119		0.01866		20.550	42.1
0.0188	0.01882		0.00119		0.01876		20.508	42.0
0.0189	0.01892		0.00120		0.01886		20.466	41.8
0.0190	0.01902	10.0	1.00120	0.5	0.01896	10.0	20.424	41.6
0.0191	0.01912		0.00121		0.01906		20.383	41.4
0.0192	0.01922		0.00121		0.01916		20.342	41.3
0.0193	0.01932		0.00122		0.01926		20.300	41.1
0.0194	0.01942		0.00122		0.01936		20.259	40.9
0.0195	0.01952	10.0	1.00123	0.5	0.01946	10.0	20.218	40.8
0.0196	0.01962		0.00123		0.01956		20.178	40.6
0.0197	0.01972		0.00124		0.01966		20.137	40.5
0.0198	0.01982		0.00124		0.01976		20.097	40.3
0.0199	0.01992		0.00125		0.01986		20.057	40.1
0.0200	0.02002	10.0	1.00125	0.5	0.01996	10.0	20.017	40.0
u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '

Natural Hyperbolic Functions.

x	$\sinh x$	$\cosh x$	$\tanh x$	$\coth x$	$\sinh^{-1} x$	$\cosh^{-1} x$	$\tanh^{-1} x$	$\coth^{-1} x$
0.0500	0.05002	1.00125	0.5	0.00000	0.05000	1.00000	20.147	1.000
0.0501	0.05012	1.00126	0.5	0.00000	0.05010	1.00000	20.157	1.001
0.0502	0.05022	1.00126	0.5	0.00000	0.05020	1.00000	20.167	1.002
0.0503	0.05032	1.00127	0.5	0.00000	0.05030	1.00000	20.177	1.003
0.0504	0.05042	1.00127	0.5	0.00000	0.05040	1.00000	20.188	1.004
0.0505	0.05052	1.00128	0.5	0.00000	0.05050	1.00000	20.199	1.005
0.0506	0.05062	1.00128	0.5	0.00000	0.05060	1.00000	20.210	1.006
0.0507	0.05072	1.00129	0.5	0.00000	0.05070	1.00000	20.221	1.007
0.0508	0.05082	1.00129	0.5	0.00000	0.05080	1.00000	20.232	1.008
0.0509	0.05092	1.00130	0.5	0.00000	0.05090	1.00000	20.243	1.009
0.0510	0.05102	1.00130	0.5	0.00000	0.05100	1.00000	20.254	1.010
0.0511	0.05112	1.00131	0.5	0.00000	0.05110	1.00000	20.265	1.011
0.0512	0.05122	1.00131	0.5	0.00000	0.05120	1.00000	20.276	1.012
0.0513	0.05132	1.00132	0.5	0.00000	0.05130	1.00000	20.287	1.013
0.0514	0.05142	1.00132	0.5	0.00000	0.05140	1.00000	20.298	1.014
0.0515	0.05152	1.00133	0.5	0.00000	0.05150	1.00000	20.309	1.015
0.0516	0.05162	1.00133	0.5	0.00000	0.05160	1.00000	20.320	1.016
0.0517	0.05172	1.00134	0.5	0.00000	0.05170	1.00000	20.331	1.017
0.0518	0.05182	1.00134	0.5	0.00000	0.05180	1.00000	20.342	1.018
0.0519	0.05192	1.00135	0.5	0.00000	0.05190	1.00000	20.353	1.019
0.0520	0.05202	1.00135	0.5	0.00000	0.05200	1.00000	20.364	1.020
0.0521	0.05212	1.00136	0.5	0.00000	0.05210	1.00000	20.375	1.021
0.0522	0.05222	1.00136	0.5	0.00000	0.05220	1.00000	20.386	1.022
0.0523	0.05232	1.00137	0.5	0.00000	0.05230	1.00000	20.397	1.023
0.0524	0.05242	1.00137	0.5	0.00000	0.05240	1.00000	20.408	1.024
0.0525	0.05252	1.00138	0.5	0.00000	0.05250	1.00000	20.419	1.025
0.0526	0.05262	1.00138	0.5	0.00000	0.05260	1.00000	20.430	1.026
0.0527	0.05272	1.00139	0.5	0.00000	0.05270	1.00000	20.441	1.027
0.0528	0.05282	1.00139	0.5	0.00000	0.05280	1.00000	20.452	1.028
0.0529	0.05292	1.00140	0.5	0.00000	0.05290	1.00000	20.463	1.029
0.0530	0.05302	1.00140	0.5	0.00000	0.05300	1.00000	20.474	1.030
0.0531	0.05312	1.00141	0.5	0.00000	0.05310	1.00000	20.485	1.031
0.0532	0.05322	1.00142	0.5	0.00000	0.05320	1.00000	20.496	1.032
0.0533	0.05332	1.00142	0.5	0.00000	0.05330	1.00000	20.507	1.033
0.0534	0.05342	1.00143	0.5	0.00000	0.05340	1.00000	20.518	1.034
0.0535	0.05352	1.00143	0.5	0.00000	0.05350	1.00000	20.529	1.035
0.0536	0.05362	1.00144	0.5	0.00000	0.05360	1.00000	20.540	1.036
0.0537	0.05372	1.00144	0.5	0.00000	0.05370	1.00000	20.551	1.037
0.0538	0.05382	1.00145	0.5	0.00000	0.05380	1.00000	20.562	1.038
0.0539	0.05392	1.00145	0.5	0.00000	0.05390	1.00000	20.573	1.039
0.0540	0.05402	1.00146	0.5	0.00000	0.05400	1.00000	20.584	1.040
0.0541	0.05412	1.00146	0.5	0.00000	0.05410	1.00000	20.595	1.041
0.0542	0.05422	1.00147	0.5	0.00000	0.05420	1.00000	20.606	1.042
0.0543	0.05432	1.00147	0.5	0.00000	0.05430	1.00000	20.617	1.043
0.0544	0.05442	1.00148	0.5	0.00000	0.05440	1.00000	20.628	1.044
0.0545	0.05452	1.00149	0.5	0.00000	0.05450	1.00000	20.639	1.045
0.0546	0.05462	1.00149	0.5	0.00000	0.05460	1.00000	20.650	1.046
0.0547	0.05472	1.00150	0.5	0.00000	0.05470	1.00000	20.661	1.047
0.0548	0.05482	1.00150	0.5	0.00000	0.05480	1.00000	20.672	1.048
0.0549	0.05492	1.00151	0.5	0.00000	0.05490	1.00000	20.683	1.049
0.0550	0.05502	1.00151	0.5	0.00000	0.05500	1.00000	20.694	1.050
x	$\sinh x$	$\cosh x$	$\tanh x$	$\coth x$	$\sinh^{-1} x$	$\cosh^{-1} x$	$\tanh^{-1} x$	$\coth^{-1} x$

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	cotanh u	= F ₄ '
0.0550	0.05503	10.0	1.00151	0.6	0.05494	10.0	18.200	33.0
0.0551	0.05513		0.00152		0.05504		18.169	33.0
0.0552	0.05523		0.00152		0.05514		18.138	33.0
0.0553	0.05533		0.00153		0.05524		18.107	33.0
0.0554	0.05543		0.00153		0.05534		18.076	33.0
0.0555	0.05553	10.0	1.00154	0.6	0.05544	10.0	18.037	33.4
0.0556	0.05563		0.00155		0.05554		18.004	33.3
0.0557	0.05573		0.00155		0.05564		17.974	33.2
0.0558	0.05583		0.00156		0.05574		17.940	33.1
0.0559	0.05593		0.00156		0.05584		17.908	33.0
0.0560	0.05603	10.0	1.00157	0.6	0.05594	10.0	17.876	31.9
0.0561	0.05613		0.00157		0.05604		17.844	31.7
0.0562	0.05623		0.00158		0.05614		17.812	31.6
0.0563	0.05633		0.00159		0.05624		17.781	31.5
0.0564	0.05643		0.00159		0.05634		17.749	31.4
0.0565	0.05653	10.0	1.00160	0.6	0.05644	10.0	17.718	31.3
0.0566	0.05663		0.00160		0.05654		17.687	31.2
0.0567	0.05673		0.00161		0.05664		17.656	31.1
0.0568	0.05683		0.00161		0.05674		17.625	31.0
0.0569	0.05693		0.00162		0.05684		17.594	30.9
0.0570	0.05703	10.0	1.00162	0.6	0.05694	10.0	17.563	30.7
0.0571	0.05713		0.00163		0.05704		17.532	30.6
0.0572	0.05723		0.00164		0.05714		17.501	30.5
0.0573	0.05733		0.00164		0.05724		17.471	30.4
0.0574	0.05743		0.00165		0.05734		17.441	30.3
0.0575	0.05753	10.0	1.00165	0.6	0.05744	10.0	17.410	30.2
0.0576	0.05763		0.00166		0.05754		17.380	30.1
0.0577	0.05773		0.00167		0.05764		17.350	30.0
0.0578	0.05783		0.00167		0.05774		17.320	29.9
0.0579	0.05793		0.00168		0.05784		17.290	29.8
0.0580	0.05803	10.0	1.00168	0.6	0.05794	10.0	17.261	29.7
0.0581	0.05813		0.00169		0.05804		17.231	29.6
0.0582	0.05823		0.00169		0.05813		17.202	29.5
0.0583	0.05833		0.00170		0.05823		17.172	29.4
0.0584	0.05843		0.00171		0.05833		17.143	29.3
0.0585	0.05853	10.0	1.00171	0.6	0.05843	10.0	17.114	29.2
0.0586	0.05863		0.00172		0.05853		17.084	29.1
0.0587	0.05873		0.00172		0.05863		17.055	29.0
0.0588	0.05883		0.00173		0.05873		17.026	28.9
0.0589	0.05893		0.00174		0.05883		16.998	28.8
0.0590	0.05903	10.0	1.00174	0.6	0.05893	10.0	16.969	28.7
0.0591	0.05913		0.00175		0.05903		16.940	28.6
0.0592	0.05923		0.00175		0.05913		16.912	28.5
0.0593	0.05933		0.00176		0.05923		16.883	28.4
0.0594	0.05943		0.00176		0.05933		16.855	28.3
0.0595	0.05954	10.0	1.00177	0.6	0.05943	10.0	16.827	28.2
0.0596	0.05964		0.00178		0.05953		16.798	28.1
0.0597	0.05974		0.00178		0.05963		16.770	28.0
0.0598	0.05984		0.00179		0.05973		16.742	27.9
0.0599	0.05994		0.00179		0.05983		16.714	27.8
0.0600	0.06004	10.0	1.00180	0.6	0.05993	10.0	16.687	27.7
u	log u	= F ₁ '	sec u	= F ₂ '	sin u	= F ₃ '	csc u	= F ₄ '

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	sech u	= F ₄ '
0.0000	0.00000	10.0	1.00180	0.0	0.00000	10.0	10.000	27.7
0.0001	0.00010		0.00181	0.0001	0.00000		10.000	27.7
0.0002	0.00020		0.00181	0.0002	0.00000		10.000	27.7
0.0003	0.00030		0.00182	0.0003	0.00000		10.000	27.7
0.0004	0.00040		0.00182	0.0004	0.00000		10.000	27.7
0.0005	0.00050	10.0	1.00183	0.0	0.00001	10.0	10.000	27.7
0.0006	0.00060		0.00183	0.0005	0.00001		10.000	27.7
0.0007	0.00070		0.00183	0.0006	0.00001		10.000	27.7
0.0008	0.00080		0.00183	0.0007	0.00001		10.000	27.7
0.0009	0.00090		0.00183	0.0008	0.00001		10.000	27.7
0.0010	0.00100	10.0	1.00186	0.0	0.00001	10.0	10.000	27.8
0.0011	0.00110		0.00187	0.0010	0.00001		10.000	27.8
0.0012	0.00120		0.00187	0.0011	0.00001		10.000	27.8
0.0013	0.00130		0.00188	0.0012	0.00001		10.000	27.8
0.0014	0.00140		0.00189	0.0013	0.00001		10.000	27.8
0.0015	0.00150	10.0	1.00189	0.0	0.00001	10.0	10.000	27.8
0.0016	0.00160		0.00190	0.0015	0.00001		10.000	27.8
0.0017	0.00170		0.00190	0.0016	0.00001		10.000	27.8
0.0018	0.00180		0.00191	0.0017	0.00001		10.000	27.8
0.0019	0.00190		0.00192	0.0018	0.00001		10.000	27.8
0.0020	0.00200	10.0	1.00192	0.0	0.00002	10.0	10.000	27.9
0.0021	0.00210		0.00193	0.0020	0.00002		10.000	27.9
0.0022	0.00220		0.00193	0.0021	0.00002		10.000	27.9
0.0023	0.00230		0.00193	0.0022	0.00002		10.000	27.9
0.0024	0.00240		0.00193	0.0023	0.00002		10.000	27.9
0.0025	0.00250	10.0	1.00195	0.0	0.00002	10.0	10.000	27.9
0.0026	0.00260		0.00195	0.0025	0.00002		10.000	27.9
0.0027	0.00270		0.00197	0.0026	0.00002		10.000	27.9
0.0028	0.00280		0.00197	0.0027	0.00002		10.000	27.9
0.0029	0.00290		0.00198	0.0028	0.00002		10.000	27.9
0.0030	0.00300	10.0	1.00199	0.0	0.00002	10.0	10.000	28.0
0.0031	0.00310		0.00200	0.0030	0.00002		10.000	28.0
0.0032	0.00320		0.00200	0.0031	0.00002		10.000	28.0
0.0033	0.00330		0.00200	0.0032	0.00002		10.000	28.0
0.0034	0.00340		0.00201	0.0033	0.00002		10.000	28.0
0.0035	0.00350	10.0	1.00202	0.0	0.00002	10.0	10.000	28.0
0.0036	0.00360		0.00202	0.0035	0.00002		10.000	28.0
0.0037	0.00370		0.00203	0.0036	0.00002		10.000	28.0
0.0038	0.00380		0.00203	0.0037	0.00002		10.000	28.0
0.0039	0.00390		0.00203	0.0038	0.00002		10.000	28.0
0.0040	0.00400	10.0	1.00205	0.0	0.00003	10.0	10.000	28.1
0.0041	0.00410		0.00205	0.0040	0.00003		10.000	28.1
0.0042	0.00420		0.00205	0.0041	0.00003		10.000	28.1
0.0043	0.00430		0.00207	0.0042	0.00003		10.000	28.1
0.0044	0.00440		0.00207	0.0043	0.00003		10.000	28.1
0.0045	0.00450	10.0	1.00208	0.0	0.00003	10.0	10.000	28.1
0.0046	0.00460		0.00209	0.0045	0.00003		10.000	28.1
0.0047	0.00470		0.00209	0.0046	0.00003		10.000	28.1
0.0048	0.00480		0.00210	0.0047	0.00003		10.000	28.1
0.0049	0.00490		0.00211	0.0048	0.00003		10.000	28.1
0.0050	0.00500	10.0	1.00211	0.0	0.00004	10.0	10.000	28.2
u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	sech u	= F ₄ '

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	sech u	= F ₄ '
0.0690	0.06903	10.0	1.00211	0.7	0.06901	10.0	15.406	23.6
.0691	.06915		.00212		.06901		15.383	23.6
.0692	.06928		.00213		.06911		15.359	23.5
.0693	.06935		.00213		.06921		15.336	23.4
.0694	.06945		.00214		.06931		15.312	23.3
0.0695	0.06953	10.0	1.00215	0.7	0.06941	10.0	15.289	23.3
.0696	.06965		.00215		.06951		15.266	23.2
.0697	.06975		.00216		.06961		15.243	23.1
.0698	.06985		.00217		.06971		15.219	23.1
.0699	.06995		.00217		.06980		15.196	23.0
0.0700	0.07005	10.0	1.00218	0.7	0.07000	10.0	15.174	22.9
.0701	.07015		.00219		.07000		15.151	22.9
.0702	.07025		.00219		.07010		15.128	22.8
.0703	.07035		.00220		.07020		15.105	22.7
.0704	.07045		.00221		.07030		15.082	22.6
0.0705	0.07055	10.0	1.00221	0.7	0.07040	10.0	15.060	22.6
.0706	.07065		.00222		.07050		15.037	22.5
.0707	.07075		.00223		.07060		15.015	22.4
.0708	.07085		.00223		.07070		14.992	22.4
.0709	.07095		.00224		.07080		14.970	22.3
0.0710	0.07105	10.0	1.00225	0.7	0.07090	10.0	14.948	22.2
.0711	.07115		.00225		.07100		14.925	22.2
.0712	.07125		.00226		.07110		14.903	22.1
.0713	.07135		.00227		.07120		14.881	22.0
.0714	.07145		.00227		.07130		14.859	22.0
0.0715	0.07155	10.0	1.00228	0.7	0.07140	10.0	14.837	21.9
.0716	.07165		.00229		.07150		14.815	21.8
.0717	.07175		.00229		.07160		14.794	21.8
.0718	.07185		.00230		.07170		14.772	21.7
.0719	.07195		.00231		.07180		14.750	21.7
0.0720	0.07205	10.0	1.00231	0.7	0.07190	10.0	14.729	21.6
.0721	.07215		.00232		.07200		14.707	21.5
.0722	.07225		.00233		.07210		14.685	21.5
.0723	.07235		.00233		.07220		14.664	21.4
.0724	.07245		.00234		.07230		14.643	21.3
0.0725	0.07255	10.0	1.00235	0.7	0.07240	10.0	14.621	21.3
.0726	.07265		.00235		.07250		14.600	21.2
.0727	.07275		.00236		.07260		14.579	21.2
.0728	.07285		.00237		.07270		14.558	21.1
.0729	.07295		.00237		.07280		14.537	21.0
0.0730	0.07305	10.0	1.00238	0.7	0.07290	10.0	14.516	21.0
.0731	.07316		.00239		.07300		14.495	20.9
.0732	.07325		.00240		.07310		14.474	20.8
.0733	.07335		.00240		.07320		14.453	20.8
.0734	.07346		.00241		.07330		14.432	20.7
0.0735	0.07355	10.0	1.00242	0.7	0.07340	10.0	14.412	20.7
.0736	.07366		.00242		.07350		14.391	20.6
.0737	.07375		.00243		.07360		14.370	20.6
.0738	.07385		.00244		.07370		14.350	20.5
.0739	.07396		.00244		.07380		14.329	20.4
0.0740	0.07406	10.0	1.00245	0.7	0.07390	10.0	14.309	20.4
u	tanh u	= F ₁ '	sech u	= F ₂ '	sinh u	= F ₃ '	cosh u	= F ₄ '

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	csch u	= F ₄ '
0.0700 .0701 .0702 .0703 .0704	0.07006 .07016 .07026 .07036 .07046	100	1.00215 .00216 .00217 .00217 .00218	0.7	0.06626 .06627 .06628 .06628 .06628	100	14.309 14.314 14.318 14.322 14.325	33.4 33.5 33.5 33.5 33.1
0.0705 .0706 .0707 .0708 .0709	0.07056 .07066 .07076 .07086 .07096	110	1.00219 .00219 .00220 .00221 .00221	0.7	0.06638 .06638 .06638 .06638 .06638	100	14.308 14.313 14.317 14.321 14.325	33.1 33.0 33.0 33.0 33.0
0.0710 .0711 .0712 .0713 .0714	0.07106 .07116 .07126 .07136 .07146	120	1.00222 .00223 .00224 .00225 .00225	0.7	0.06648 .06648 .06648 .06648 .06648	100	14.308 14.313 14.317 14.321 14.325	33.8 33.7 33.7 33.6 33.6
0.0715 .0716 .0717 .0718 .0719	0.07156 .07166 .07176 .07186 .07196	130	1.00225 .00226 .00227 .00228 .00229	0.7	0.06658 .06658 .06658 .06658 .06658	100	14.308 14.313 14.317 14.321 14.325	33.5 33.5 33.4 33.4 33.3
0.0720 .0721 .0722 .0723 .0724	0.07206 .07216 .07226 .07236 .07246	140	1.00229 .00230 .00231 .00231 .00232	0.7	0.06668 .06668 .06668 .06668 .06668	100	14.308 14.313 14.317 14.321 14.325	33.1 33.2 33.2 33.1 33.0
0.0725 .0726 .0727 .0728 .0729	0.07256 .07266 .07276 .07286 .07296	150	1.00233 .00234 .00235 .00235 .00236	0.7	0.06677 .06677 .06677 .06677 .06677	100	14.307 14.312 14.316 14.320 14.324	33.0 33.0 33.0 33.0 33.0
0.0730 .0731 .0732 .0733 .0734	0.07306 .07317 .07327 .07337 .07347	160	1.00237 .00237 .00238 .00239 .00240	0.7	0.06687 .06687 .06687 .06687 .06687	100	14.307 14.311 14.315 14.319 14.323	33.7 33.7 33.6 33.6 33.5
0.0735 .0736 .0737 .0738 .0739	0.07357 .07367 .07377 .07387 .07397	170	1.00240 .00241 .00242 .00242 .00243	0.7	0.06697 .06697 .06697 .06697 .06697	100	14.307 14.311 14.315 14.319 14.323	33.5 33.4 33.4 33.3 33.3
0.0740 .0741 .0742 .0743 .0744	0.07407 .07417 .07427 .07437 .07447	180	1.00244 .00245 .00245 .00246 .00247	0.7	0.06707 .06707 .06707 .06707 .06707	100	14.307 14.311 14.315 14.319 14.323	33.4 33.4 33.3 33.3 33.0
0.0745 .0746 .0747 .0748 .0749	0.07457 .07467 .07477 .07487 .07497	190	1.00248 .00248 .00249 .00250 .00251	0.7	0.06716 .06716 .06716 .06716 .06716	100	14.307 14.311 14.315 14.319 14.323	33.0 33.0 33.0 33.0 33.0
0.0750	0.07507	200	1.00251	0.8	0.06726	100	14.307	33.7
z	log pH z	= F ₅ '	sec pH z	= F ₆ '	sin pH z	= F ₇ '	csc pH z	= F ₈ '

Natural Hyperbolic Functions.

u	sinh u	w F ₁ '	cosh u	w F ₁ '	tanh u	w F ₁ '	coth u	w F ₁ '
0.0750	0.07517	10.0	1.00281	0.8	0.07486	9.0	13.358	17.2
0.0751	0.07517		1.00282		0.07486		13.361	17.2
0.0752	0.07517		1.00283		0.07486		13.363	17.2
0.0753	0.07517		1.00284		0.07486		13.365	17.2
0.0754	0.07517		1.00285		0.07486		13.368	17.2
0.0755	0.07517	10.0	1.00285	0.8	0.07486	9.0	13.370	17.5
0.0756	0.07517		1.00286		0.07486		13.373	17.5
0.0757	0.07517		1.00287		0.07486		13.375	17.5
0.0758	0.07517		1.00287		0.07486		13.378	17.5
0.0759	0.07517		1.00288		0.07486		13.381	17.5
0.0760	0.07517	10.0	1.00289	0.8	0.07486	9.0	13.383	17.5
0.0761	0.07517		1.00290		0.07486		13.386	17.5
0.0762	0.07517		1.00290		0.07486		13.389	17.5
0.0763	0.07517		1.00291		0.07486		13.392	17.5
0.0764	0.07517		1.00292		0.07486		13.394	17.5
0.0765	0.07517	10.0	1.00293	0.8	0.07486	9.0	13.397	17.5
0.0766	0.07517		1.00294		0.07486		13.400	17.5
0.0767	0.07517		1.00294		0.07486		13.403	17.5
0.0768	0.07517		1.00295		0.07486		13.406	17.5
0.0769	0.07517		1.00296		0.07486		13.409	17.5
0.0770	0.07517	10.0	1.00297	0.8	0.07486	9.0	13.411	16.8
0.0771	0.07517		1.00297		0.07486		13.414	16.8
0.0772	0.07517		1.00298		0.07486		13.417	16.8
0.0773	0.07517		1.00299		0.07486		13.420	16.8
0.0774	0.07517		1.00300		0.07486		13.423	16.8
0.0775	0.07517	10.0	1.00300	0.8	0.07486	9.0	13.426	16.8
0.0776	0.07517		1.00301		0.07486		13.429	16.8
0.0777	0.07517		1.00302		0.07486		13.432	16.8
0.0778	0.07517		1.00303		0.07486		13.435	16.8
0.0779	0.07517		1.00304		0.07486		13.438	16.8
0.0780	0.07517	10.0	1.00305	0.8	0.07486	9.0	13.441	16.8
0.0781	0.07517		1.00305		0.07486		13.444	16.8
0.0782	0.07517		1.00306		0.07486		13.447	16.8
0.0783	0.07517		1.00307		0.07486		13.450	16.8
0.0784	0.07517		1.00307		0.07486		13.453	16.8
0.0785	0.07517	10.0	1.00308	0.8	0.07486	9.0	13.456	16.8
0.0786	0.07517		1.00309		0.07486		13.459	16.8
0.0787	0.07517		1.00310		0.07486		13.462	16.8
0.0788	0.07517		1.00311		0.07486		13.465	16.8
0.0789	0.07517		1.00311		0.07486		13.468	16.8
0.0790	0.07517	10.0	1.00312	0.8	0.07486	9.0	13.471	16.8
0.0791	0.07517		1.00313		0.07486		13.474	16.8
0.0792	0.07517		1.00314		0.07486		13.477	16.8
0.0793	0.07517		1.00315		0.07486		13.480	16.8
0.0794	0.07517		1.00315		0.07486		13.483	16.8
0.0795	0.07517	10.0	1.00316	0.8	0.07486	9.0	13.486	16.8
0.0796	0.07517		1.00317		0.07486		13.489	16.8
0.0797	0.07517		1.00318		0.07486		13.492	16.8
0.0798	0.07517		1.00319		0.07486		13.495	16.8
0.0799	0.07517		1.00319		0.07486		13.498	16.8
0.0800	0.07517	10.0	1.00320	0.8	0.07486	9.0	13.501	16.8
u	tanh u	w F ₁ '	coth u	w F ₁ '	sinh u	w F ₁ '	cosh u	w F ₁ '

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
0.0800	0.08000	10.0	1.00220	0.8	0.07983	9.0	12.527	15.6
0.0801	0.08010		1.00221		0.07993		12.531	15.6
0.0802	0.08020		1.00222		0.08003		12.535	15.5
0.0803	0.08030		1.00223		0.08013		12.539	15.5
0.0804	0.08040		1.00224		0.08023		12.543	15.4
0.0805	0.08050	10.0	1.00224	0.8	0.08033	9.0	12.549	15.4
0.0806	0.08060		1.00225		0.08043		12.553	15.4
0.0807	0.08070		1.00226		0.08053		12.557	15.3
0.0808	0.08080		1.00227		0.08063		12.561	15.3
0.0809	0.08090		1.00227		0.08073		12.565	15.2
0.0810	0.08100	10.0	1.00228	0.8	0.08083	9.0	12.571	15.2
0.0811	0.08110		1.00229		0.08093		12.575	15.2
0.0812	0.08120		1.00230		0.08103		12.579	15.1
0.0813	0.08130		1.00231		0.08113		12.583	15.1
0.0814	0.08140		1.00231		0.08123		12.587	15.1
0.0815	0.08150	10.0	1.00232	0.8	0.08133	9.0	12.593	15.0
0.0816	0.08160		1.00233		0.08143		12.597	15.0
0.0817	0.08170		1.00234		0.08153		12.601	14.9
0.0818	0.08180		1.00235		0.08163		12.605	14.9
0.0819	0.08190		1.00235		0.08173		12.609	14.9
0.0820	0.08200	10.0	1.00236	0.8	0.08183	9.0	12.615	14.8
0.0821	0.08210		1.00237		0.08193		12.619	14.8
0.0822	0.08220		1.00238		0.08203		12.623	14.8
0.0823	0.08230		1.00239		0.08213		12.627	14.7
0.0824	0.08240		1.00240		0.08223		12.631	14.7
0.0825	0.08250	10.0	1.00241	0.8	0.08233	9.0	12.637	14.7
0.0826	0.08260		1.00241		0.08243		12.641	14.6
0.0827	0.08270		1.00242		0.08253		12.645	14.6
0.0828	0.08280		1.00243		0.08263		12.649	14.6
0.0829	0.08290		1.00244		0.08273		12.653	14.5
0.0830	0.08300	10.0	1.00245	0.8	0.08283	9.0	12.659	14.5
0.0831	0.08310		1.00245		0.08293		12.663	14.4
0.0832	0.08320		1.00246		0.08303		12.667	14.4
0.0833	0.08330		1.00247		0.08313		12.671	14.4
0.0834	0.08340		1.00248		0.08323		12.675	14.3
0.0835	0.08350	10.0	1.00249	0.8	0.08333	9.0	12.681	14.3
0.0836	0.08360		1.00250		0.08343		12.685	14.3
0.0837	0.08370		1.00250		0.08353		12.689	14.2
0.0838	0.08380		1.00251		0.08363		12.693	14.2
0.0839	0.08390		1.00252		0.08373		12.697	14.2
0.0840	0.08400	10.0	1.00253	0.8	0.08383	9.0	12.703	14.1
0.0841	0.08410		1.00254		0.08393		12.707	14.1
0.0842	0.08420		1.00255		0.08403		12.711	14.1
0.0843	0.08430		1.00256		0.08413		12.715	14.0
0.0844	0.08440		1.00256		0.08423		12.719	14.0
0.0845	0.08450	10.0	1.00257	0.8	0.08433	9.0	12.725	14.0
0.0846	0.08460		1.00258		0.08443		12.729	13.9
0.0847	0.08470		1.00259		0.08453		12.733	13.9
0.0848	0.08480		1.00260		0.08463		12.737	13.9
0.0849	0.08490		1.00261		0.08473		12.741	13.8
0.0850	0.08500	10.0	1.00261	0.9	0.08483	9.0	12.747	13.8
u	tanh u	= F ₁ '	sec gd u	= F ₂ '	sin gd u	= F ₃ '	cos gd u	= F ₄ '

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
0.0850 .0851 .0852 .0853 .0854	0.08510 .08520 .08530 .08540 .08550	100	1.00361 .00362 .00363 .00364 .00365	0.0	0.08490 .08490 .08490 .08490 .08490	100	11.703 11.779 11.795 11.752 11.738	13.8 13.8 13.7 13.7 13.7
0.0855 .0856 .0857 .0858 .0859	0.08560 .08570 .08580 .08590 .08600	100	1.00366 .00367 .00367 .00368 .00369	0.0	0.08520 .08520 .08520 .08520 .08520	100	11.724 11.711 11.697 11.684 11.670	13.6 13.6 13.6 13.6 13.5
0.0860 .0861 .0862 .0863 .0864	0.08610 .08620 .08630 .08640 .08650	100	1.00370 .00371 .00371 .00372 .00373	0.0	0.08570 .08570 .08570 .08570 .08570	90	11.657 11.643 11.630 11.616 11.603	13.5 13.5 13.4 13.4 13.4
0.0865 .0866 .0867 .0868 .0869	0.08660 .08670 .08680 .08690 .08700	100	1.00374 .00375 .00376 .00377 .00378	0.0	0.08620 .08620 .08620 .08620 .08620	90	11.590 11.576 11.563 11.550 11.536	13.3 13.3 13.3 13.2 13.2
0.0870 .0871 .0872 .0873 .0874	0.08710 .08720 .08730 .08740 .08750	100	1.00379 .00380 .00380 .00381 .00382	0.0	0.08670 .08670 .08670 .08670 .08670	90	11.523 11.510 11.497 11.484 11.471	13.2 13.1 13.1 13.1 13.1
0.0875 .0876 .0877 .0878 .0879	0.08760 .08770 .08780 .08790 .08800	100	1.00383 .00384 .00385 .00386 .00387	0.0	0.08720 .08720 .08720 .08720 .08720	90	11.454 11.445 11.432 11.419 11.406	13.0 13.0 12.9 12.9 12.9
0.0880 .0881 .0882 .0883 .0884	0.08810 .08820 .08830 .08840 .08850	100	1.00387 .00388 .00389 .00390 .00391	0.0	0.08770 .08770 .08770 .08770 .08770	100	11.393 11.380 11.367 11.354 11.342	12.9 12.8 12.8 12.8 12.8
0.0885 .0886 .0887 .0888 .0889	0.08860 .08870 .08880 .08890 .08900	100	1.00392 .00393 .00394 .00395 .00395	0.0	0.08820 .08820 .08820 .08820 .08820	90	11.326 11.316 11.303 11.290 11.278	12.7 12.7 12.7 12.6 12.6
0.0890 .0891 .0892 .0893 .0894	0.08910 .08920 .08930 .08940 .08950	100	1.00396 .00397 .00398 .00399 .00400	0.0	0.08870 .08870 .08870 .08870 .08870	90	11.266 11.253 11.240 11.228 11.215	12.6 12.6 12.5 12.5 12.5
0.0895 .0896 .0897 .0898 .0899	0.08960 .08970 .08980 .08990 .09000	100	1.00401 .00402 .00403 .00404 .00404	0.0	0.08920 .08920 .08920 .08920 .08920	90	11.203 11.191 11.178 11.165 11.153	12.5 12.4 12.4 12.4 12.3
0.0900	0.09010	100	1.00405	0.0	0.08970	90	11.141	12.3
u	tanh u	= F ₁ '	coth u	= F ₂ '	sinh u	= F ₃ '	csch u	= F ₄ '

Natural Hyperbolic Functions.

x	$\sinh x$	$= F_1'$	$\cosh x$	$= F_2'$	$\tanh x$	$= F_3'$	$\coth x$	$= F_4'$
0.0000	0.00012	10.0	1.00105	0.0	0.00020	10.0	11.143	14.3
.0001	.00012		.00106		.00020		11.129	14.3
.0002	.00013		.00107		.00020		11.117	14.3
.0003	.00013		.00108		.00020		11.104	14.2
.0004	.00013		.00109		.00015		11.093	14.2
0.0005	0.00013	10.0	1.00110	0.0	0.00015	10.0	11.080	14.2
.0006	.00012		.00111		.00015		11.068	14.1
.0007	.00012		.00112		.00015		11.056	14.1
.0008	.00012		.00113		.00015		11.043	14.1
.0009	.00013		.00113		.00015		11.031	14.1
0.0010	0.00113	10.0	1.00114	0.0	0.00015	10.0	11.019	14.0
.0011	.00113		.00115		.00015		11.007	14.0
.0012	.00113		.00116		.00015		10.995	14.0
.0013	.00113		.00117		.00015		10.983	14.0
.0014	.00113		.00118		.00015		10.971	14.0
0.0015	0.00113	10.0	1.00119	0.0	0.00113	10.0	10.959	13.9
.0016	.00113		.00120		.00113		10.948	13.9
.0017	.00113		.00121		.00113		10.936	13.9
.0018	.00113		.00122		.00113		10.924	13.8
.0019	.00113		.00123		.00113		10.912	13.8
0.0020	0.00113	10.0	1.00123	0.0	0.00121	10.0	10.900	13.8
.0021	.00123		.00124		.00121		10.888	13.8
.0022	.00123		.00125		.00121		10.877	13.7
.0023	.00123		.00126		.00121		10.865	13.7
.0024	.00123		.00127		.00121		10.853	13.7
0.0025	0.00123	10.0	1.00128	0.0	0.00121	10.0	10.842	13.7
.0026	.00123		.00129		.00121		10.830	13.6
.0027	.00123		.00130		.00121		10.818	13.6
.0028	.00123		.00131		.00121		10.806	13.6
.0029	.00123		.00132		.00121		10.795	13.6
0.0030	0.00123	10.0	1.00133	0.0	0.00121	10.0	10.783	13.5
.0031	.00123		.00134		.00121		10.772	13.5
.0032	.00123		.00135		.00121		10.761	13.5
.0033	.00123		.00136		.00121		10.750	13.5
.0034	.00123		.00136		.00121		10.738	13.4
0.0035	0.00123	10.0	1.00137	0.0	0.00121	10.0	10.726	13.4
.0036	.00123		.00138		.00121		10.715	13.4
.0037	.00123		.00139		.00121		10.704	13.4
.0038	.00123		.00140		.00121		10.692	13.3
.0039	.00123		.00141		.00121		10.681	13.3
0.0040	0.00123	10.0	1.00142	0.0	0.00121	10.0	10.670	13.3
.0041	.00123		.00143		.00121		10.658	13.3
.0042	.00123		.00144		.00121		10.647	13.2
.0043	.00123		.00145		.00121		10.636	13.2
.0044	.00123		.00146		.00121		10.625	13.2
0.0045	0.00123	10.0	1.00147	0.0	0.00121	10.0	10.613	13.2
.0046	.00123		.00148		.00121		10.602	13.1
.0047	.00123		.00149		.00121		10.591	13.1
.0048	.00123		.00150	0.0	.00121		10.580	13.1
.0049	.00123		.00151	1.0	.00121		10.569	13.1
0.0050	0.00123	10.0	1.00152	1.0	0.00121	0.0	10.558	13.0
x	$\sinh x$	$= F_1'$	$\cosh x$	$= F_2'$	$\tanh x$	$= F_3'$	$\coth x$	$= F_4'$

SMITHSONIAN TABLES

Natural Hyperbolic Functions.

u	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$	$\tanh u$	$= F_3'$	$\coth u$	$= F_4'$
0.100	0.10017	100.5	1.00500	10.0	0.09967	99.9	10.0331	99.7
.101	.10117	100.5	.00510	10.1	.09960	99.9	9.9340	97.9
.102	.10218	100.5	.00521	10.2	.09955	99.9	8.970	95.9
.103	.10318	100.5	.00531	10.3	.09951	99.9	7.910	93.9
.104	.10419	100.5	.00541	10.4	.09947	99.9	6.950	91.9
0.105	0.10519	100.5	1.00552	10.5	0.09942	99.9	6.038	89.7
.106	.10620	100.5	.00562	10.6	.09938	99.9	5.081	87.9
.107	.10720	100.5	.00571	10.7	.09934	99.9	4.511	85.9
.108	.10821	100.5	.00581	10.8	.09930	99.9	3.957	83.9
.109	.10922	100.5	.00595	10.9	.09927	99.9	3.409	81.9
0.110	0.11022	100.5	1.00605	11.0	0.09923	99.8	2.925	79.1
.111	.11123	100.5	.00617	11.1	.09919	99.8	2.460	76.5
.112	.11223	100.5	.00628	11.2	.09915	99.8	2.059	73.9
.113	.11324	100.5	.00639	11.3	.09912	99.7	1.852	71.8
.114	.11425	100.7	.00651	11.4	.09908	99.7	1.699	69.1
0.115	0.11525	100.7	1.00662	11.5	0.09904	99.7	1.710	75.8
.116	.11626	100.7	.00674	11.6	.09900	99.7	1.623	73.8
.117	.11727	100.7	.00685	11.7	.09897	99.6	1.540	71.7
.118	.11827	100.7	.00697	11.8	.09893	99.6	1.460	69.6
.119	.11928	100.7	.00709	11.9	.09890	99.6	1.410	67.6
0.120	0.12029	100.7	1.00721	12.0	0.09886	99.6	1.373	65.1
.121	.12130	100.7	.00733	12.1	.09882	99.6	1.338	62.7
.122	.12230	100.7	.00745	12.2	.09879	99.5	1.312	60.5
.123	.12331	100.8	.00757	12.3	.09875	99.5	1.290	57.7
.124	.12432	100.8	.00770	12.4	.09872	99.5	1.268	55.9
0.125	0.12533	100.8	1.00782	12.5	0.09868	99.5	1.246	53.7
.126	.12633	100.8	.00795	12.6	.09864	99.4	1.228	51.9
.127	.12734	100.8	.00808	12.7	.09861	99.4	1.213	49.7
.128	.12835	100.8	.00820	12.8	.09857	99.4	1.195	47.9
.129	.12936	100.8	.00833	12.9	.09854	99.4	1.209	45.6
0.130	0.13037	100.8	1.00846	13.0	0.09850	99.4	1.239	48.4
.131	.13138	100.9	.00859	13.1	.09846	99.4	1.272	50.4
.132	.13238	100.9	.00872	13.2	.09842	99.4	1.307	52.6
.133	.13339	100.9	.00886	13.3	.09838	99.4	1.341	54.9
.134	.13440	100.9	.00899	13.4	.09834	99.4	1.376	55.6
0.135	0.13541	100.9	1.00913	13.5	0.09830	99.4	1.451	54.4
.136	.13642	100.9	.00926	13.6	.09826	99.4	1.487	53.4
.137	.13743	100.9	.00940	13.7	.09822	99.4	1.519	50.5
.138	.13844	101.0	.00954	13.8	.09818	99.4	1.551	51.8
.139	.13945	101.0	.00968	13.9	.09814	99.4	1.585	54.3
0.140	0.14046	101.0	1.00982	14.0	0.09810	99.4	1.625	56.0
.141	.14147	101.0	.00996	14.1	.09806	99.4	1.691	59.7
.142	.14248	101.0	.01010	14.2	.09802	99.4	1.765	62.6
.143	.14349	101.0	.01024	14.3	.09798	99.4	1.840	65.7
.144	.14450	101.0	.01039	14.4	.09794	99.4	1.924	68.9
0.145	0.14551	101.1	1.01053	14.5	0.09790	99.3	2.018	72.3
.146	.14652	101.1	.01068	14.6	.09786	99.3	2.099	75.5
.147	.14753	101.1	.01082	14.7	.09782	99.3	2.177	78.5
.148	.14854	101.1	.01097	14.8	.09778	99.3	2.260	81.7
.149	.14955	101.1	.01112	14.9	.09774	99.3	2.348	84.2
0.150	0.15056	101.1	1.01127	15.0	0.09770	99.3	2.466	87.1
u	$\tan^{-1} u$	$= F_1'$	$\sec^{-1} u$	$= F_2'$	$\sin^{-1} u$	$= F_3'$	$\cos^{-1} u$	$= F_4'$

SMITHSONIAN TABLES

Natural Hyperbolic Functions.

u	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$
0.150	0.15095	1.0113	0.14927	1.51	0.14889	1.0108	0.14766	6.7166
.151	0.15157	1.0114	0.14942	1.51	0.14901	1.0109	0.14781	6.7288
.152	0.15219	1.0115	0.14957	1.51	0.14913	1.0110	0.14796	6.7410
.153	0.15280	1.0116	0.14971	1.51	0.14925	1.0111	0.14811	6.7532
.154	0.15341	1.0117	0.14986	1.51	0.14937	1.0112	0.14826	6.7654
0.155	0.15402	1.0118	0.15000	1.51	0.15000	1.0113	0.15000	6.7776
.156	0.15463	1.0119	0.15015	1.51	0.15015	1.0114	0.15015	6.7898
.157	0.15524	1.0120	0.15030	1.51	0.15030	1.0115	0.15030	6.8020
.158	0.15585	1.0121	0.15045	1.51	0.15045	1.0116	0.15045	6.8142
.159	0.15646	1.0122	0.15060	1.51	0.15060	1.0117	0.15060	6.8264
0.160	0.15707	1.0123	0.15075	1.51	0.15075	1.0118	0.15075	6.8386
.161	0.15768	1.0124	0.15090	1.51	0.15090	1.0119	0.15090	6.8508
.162	0.15829	1.0125	0.15105	1.51	0.15105	1.0120	0.15105	6.8630
.163	0.15890	1.0126	0.15120	1.51	0.15120	1.0121	0.15120	6.8752
.164	0.15951	1.0127	0.15135	1.51	0.15135	1.0122	0.15135	6.8874
0.165	0.16012	1.0128	0.15150	1.51	0.15150	1.0123	0.15150	6.8996
.166	0.16073	1.0129	0.15165	1.51	0.15165	1.0124	0.15165	6.9118
.167	0.16134	1.0130	0.15180	1.51	0.15180	1.0125	0.15180	6.9240
.168	0.16195	1.0131	0.15195	1.51	0.15195	1.0126	0.15195	6.9362
.169	0.16256	1.0132	0.15210	1.51	0.15210	1.0127	0.15210	6.9484
0.170	0.16317	1.0133	0.15225	1.51	0.15225	1.0128	0.15225	6.9606
.171	0.16378	1.0134	0.15240	1.51	0.15240	1.0129	0.15240	6.9728
.172	0.16439	1.0135	0.15255	1.51	0.15255	1.0130	0.15255	6.9850
.173	0.16500	1.0136	0.15270	1.51	0.15270	1.0131	0.15270	6.9972
.174	0.16561	1.0137	0.15285	1.51	0.15285	1.0132	0.15285	7.0094
0.175	0.16622	1.0138	0.15300	1.51	0.15300	1.0133	0.15300	7.0216
.176	0.16683	1.0139	0.15315	1.51	0.15315	1.0134	0.15315	7.0338
.177	0.16744	1.0140	0.15330	1.51	0.15330	1.0135	0.15330	7.0460
.178	0.16805	1.0141	0.15345	1.51	0.15345	1.0136	0.15345	7.0582
.179	0.16866	1.0142	0.15360	1.51	0.15360	1.0137	0.15360	7.0704
0.180	0.16927	1.0143	0.15375	1.51	0.15375	1.0138	0.15375	7.0826
.181	0.16988	1.0144	0.15390	1.51	0.15390	1.0139	0.15390	7.0948
.182	0.17049	1.0145	0.15405	1.51	0.15405	1.0140	0.15405	7.1070
.183	0.17110	1.0146	0.15420	1.51	0.15420	1.0141	0.15420	7.1192
.184	0.17171	1.0147	0.15435	1.51	0.15435	1.0142	0.15435	7.1314
0.185	0.17232	1.0148	0.15450	1.51	0.15450	1.0143	0.15450	7.1436
.186	0.17293	1.0149	0.15465	1.51	0.15465	1.0144	0.15465	7.1558
.187	0.17354	1.0150	0.15480	1.51	0.15480	1.0145	0.15480	7.1680
.188	0.17415	1.0151	0.15495	1.51	0.15495	1.0146	0.15495	7.1802
.189	0.17476	1.0152	0.15510	1.51	0.15510	1.0147	0.15510	7.1924
0.190	0.17537	1.0153	0.15525	1.51	0.15525	1.0148	0.15525	7.2046
.191	0.17598	1.0154	0.15540	1.51	0.15540	1.0149	0.15540	7.2168
.192	0.17659	1.0155	0.15555	1.51	0.15555	1.0150	0.15555	7.2290
.193	0.17720	1.0156	0.15570	1.51	0.15570	1.0151	0.15570	7.2412
.194	0.17781	1.0157	0.15585	1.51	0.15585	1.0152	0.15585	7.2534
0.195	0.17842	1.0158	0.15600	1.51	0.15600	1.0153	0.15600	7.2656
.196	0.17903	1.0159	0.15615	1.51	0.15615	1.0154	0.15615	7.2778
.197	0.17964	1.0160	0.15630	1.51	0.15630	1.0155	0.15630	7.2900
.198	0.18025	1.0161	0.15645	1.51	0.15645	1.0156	0.15645	7.3022
.199	0.18086	1.0162	0.15660	1.51	0.15660	1.0157	0.15660	7.3144
0.200	0.18147	1.0163	0.15675	1.51	0.15675	1.0158	0.15675	7.3266

Natural Hyperbolic Functions.

u	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$
0.250	0.255361	1.031471	0.250000	1.000000	0.255361	1.031471	0.250000	1.000000
0.251	0.255804	1.031607	0.250000	1.000000	0.255804	1.031607	0.250000	1.000000
0.252	0.256248	1.031742	0.250000	1.000000	0.256248	1.031742	0.250000	1.000000
0.253	0.256691	1.031878	0.250000	1.000000	0.256691	1.031878	0.250000	1.000000
0.254	0.257134	1.032013	0.250000	1.000000	0.257134	1.032013	0.250000	1.000000
0.255	0.257577	1.032149	0.250000	1.000000	0.257577	1.032149	0.250000	1.000000
0.256	0.258020	1.032284	0.250000	1.000000	0.258020	1.032284	0.250000	1.000000
0.257	0.258463	1.032419	0.250000	1.000000	0.258463	1.032419	0.250000	1.000000
0.258	0.258906	1.032554	0.250000	1.000000	0.258906	1.032554	0.250000	1.000000
0.259	0.259349	1.032689	0.250000	1.000000	0.259349	1.032689	0.250000	1.000000
0.260	0.259792	1.032824	0.250000	1.000000	0.259792	1.032824	0.250000	1.000000
0.261	0.260235	1.032959	0.250000	1.000000	0.260235	1.032959	0.250000	1.000000
0.262	0.260678	1.033094	0.250000	1.000000	0.260678	1.033094	0.250000	1.000000
0.263	0.261121	1.033229	0.250000	1.000000	0.261121	1.033229	0.250000	1.000000
0.264	0.261564	1.033364	0.250000	1.000000	0.261564	1.033364	0.250000	1.000000
0.265	0.262007	1.033499	0.250000	1.000000	0.262007	1.033499	0.250000	1.000000
0.266	0.262450	1.033634	0.250000	1.000000	0.262450	1.033634	0.250000	1.000000
0.267	0.262893	1.033769	0.250000	1.000000	0.262893	1.033769	0.250000	1.000000
0.268	0.263336	1.033904	0.250000	1.000000	0.263336	1.033904	0.250000	1.000000
0.269	0.263779	1.034039	0.250000	1.000000	0.263779	1.034039	0.250000	1.000000
0.270	0.264222	1.034174	0.250000	1.000000	0.264222	1.034174	0.250000	1.000000
0.271	0.264665	1.034309	0.250000	1.000000	0.264665	1.034309	0.250000	1.000000
0.272	0.265108	1.034444	0.250000	1.000000	0.265108	1.034444	0.250000	1.000000
0.273	0.265551	1.034579	0.250000	1.000000	0.265551	1.034579	0.250000	1.000000
0.274	0.265994	1.034714	0.250000	1.000000	0.265994	1.034714	0.250000	1.000000
0.275	0.266437	1.034849	0.250000	1.000000	0.266437	1.034849	0.250000	1.000000
0.276	0.266880	1.034984	0.250000	1.000000	0.266880	1.034984	0.250000	1.000000
0.277	0.267323	1.035119	0.250000	1.000000	0.267323	1.035119	0.250000	1.000000
0.278	0.267766	1.035254	0.250000	1.000000	0.267766	1.035254	0.250000	1.000000
0.279	0.268209	1.035389	0.250000	1.000000	0.268209	1.035389	0.250000	1.000000
0.280	0.268652	1.035524	0.250000	1.000000	0.268652	1.035524	0.250000	1.000000
0.281	0.269095	1.035659	0.250000	1.000000	0.269095	1.035659	0.250000	1.000000
0.282	0.269538	1.035794	0.250000	1.000000	0.269538	1.035794	0.250000	1.000000
0.283	0.269981	1.035929	0.250000	1.000000	0.269981	1.035929	0.250000	1.000000
0.284	0.270424	1.036064	0.250000	1.000000	0.270424	1.036064	0.250000	1.000000
0.285	0.270867	1.036199	0.250000	1.000000	0.270867	1.036199	0.250000	1.000000
0.286	0.271310	1.036334	0.250000	1.000000	0.271310	1.036334	0.250000	1.000000
0.287	0.271753	1.036469	0.250000	1.000000	0.271753	1.036469	0.250000	1.000000
0.288	0.272196	1.036604	0.250000	1.000000	0.272196	1.036604	0.250000	1.000000
0.289	0.272639	1.036739	0.250000	1.000000	0.272639	1.036739	0.250000	1.000000
0.290	0.273082	1.036874	0.250000	1.000000	0.273082	1.036874	0.250000	1.000000
0.291	0.273525	1.037009	0.250000	1.000000	0.273525	1.037009	0.250000	1.000000
0.292	0.273968	1.037144	0.250000	1.000000	0.273968	1.037144	0.250000	1.000000
0.293	0.274411	1.037279	0.250000	1.000000	0.274411	1.037279	0.250000	1.000000
0.294	0.274854	1.037414	0.250000	1.000000	0.274854	1.037414	0.250000	1.000000
0.295	0.275297	1.037549	0.250000	1.000000	0.275297	1.037549	0.250000	1.000000
0.296	0.275740	1.037684	0.250000	1.000000	0.275740	1.037684	0.250000	1.000000
0.297	0.276183	1.037819	0.250000	1.000000	0.276183	1.037819	0.250000	1.000000
0.298	0.276626	1.037954	0.250000	1.000000	0.276626	1.037954	0.250000	1.000000
0.299	0.277069	1.038089	0.250000	1.000000	0.277069	1.038089	0.250000	1.000000
0.300	0.277512	1.038224	0.250000	1.000000	0.277512	1.038224	0.250000	1.000000

Natural Hyperbolic Functions.

x	$\sinh x$	$= F_1'$	$\cosh x$	$= F_2'$	$\tanh x$	$= F_3'$	$\coth x$	$= F_4'$
0.300	0.30452	104.5	1.04531	39.5	0.29131	91.5	1.04372	109.2
.301	.30557	104.6	.04531	39.6	.29233	91.5	.04373	107.1
.302	.30661	104.6	.04535	39.7	.29331	91.4	.04373	105.4
.303	.30766	104.6	.04539	39.8	.29430	91.4	.04372	103.9
.304	.30870	104.7	.04540	39.9	.29537	91.3	.04372	101.9
0.305	0.30975	104.7	1.04587	31.0	0.29638	91.2	1.04507	104.2
.306	.31080	104.7	.04588	31.1	.29739	91.2	.04507	103.5
.307	.31185	104.7	.04590	31.2	.29841	91.1	.04506	102.8
.308	.31289	104.8	.04591	31.3	.29942	91.1	.04505	102.1
.309	.31394	104.8	.04592	31.4	.30045	91.0	.04504	101.5
0.310	0.31499	104.8	1.04614	31.5	0.30143	91.0	1.04585	100.8
.311	.31604	104.9	.04615	31.6	.30245	90.9	.04584	100.1
.312	.31709	104.9	.04617	31.7	.30346	90.9	.04583	99.5
.313	.31814	104.9	.04618	31.8	.30448	90.8	.04582	98.8
.314	.31919	105.0	.04619	31.9	.30549	90.8	.04581	98.2
0.315	0.32024	105.0	1.04662	32.0	0.30648	90.7	1.04580	97.5
.316	.32129	105.0	.04663	32.1	.30749	90.7	.04579	96.9
.317	.32234	105.1	.04664	32.2	.30849	90.6	.04578	96.2
.318	.32339	105.1	.04665	32.3	.30949	90.6	.04577	95.6
.319	.32444	105.1	.04666	32.4	.31049	90.5	.04576	95.0
0.320	0.32549	105.2	1.04666	32.5	0.31148	90.4	1.04575	94.4
.321	.32654	105.2	.04667	32.7	.31248	90.4	.04574	93.8
.322	.32759	105.2	.04668	32.8	.31348	90.3	.04573	93.2
.323	.32864	105.3	.04669	32.9	.31448	90.3	.04572	92.6
.324	.32969	105.3	.04670	33.0	.31548	90.2	.04571	92.0
0.325	0.33075	105.3	1.04738	33.1	0.31647	90.1	1.04570	91.4
.326	.33180	105.4	.04739	33.2	.31747	90.1	.04569	90.8
.327	.33285	105.4	.04740	33.3	.31847	90.0	.04568	90.2
.328	.33390	105.4	.04741	33.4	.31947	90.0	.04567	89.7
.329	.33495	105.5	.04742	33.5	.32047	89.9	.04566	89.1
0.330	0.33602	105.5	1.04795	33.6	0.32146	89.9	1.04565	88.6
.331	.33707	105.5	.04796	33.7	.32246	89.8	.04564	88.0
.332	.33813	105.6	.04797	33.8	.32346	89.7	.04563	87.5
.333	.33919	105.6	.04798	33.9	.32446	89.7	.04562	86.9
.334	.34024	105.6	.04799	34.0	.32546	89.6	.04561	86.4
0.335	0.34130	105.7	1.04861	34.1	0.32645	89.6	1.04560	85.8
.336	.34235	105.7	.04862	34.2	.32745	89.5	.04559	85.3
.337	.34342	105.7	.04863	34.3	.32845	89.5	.04558	84.8
.338	.34447	105.8	.04864	34.4	.32945	89.4	.04557	84.3
.339	.34553	105.8	.04865	34.5	.33045	89.4	.04556	83.8
0.340	0.34660	105.8	1.04936	34.6	0.33144	89.3	1.04555	83.2
.341	.34765	105.9	.04937	34.8	.33244	89.3	.04554	82.7
.342	.34871	105.9	.04938	34.9	.33344	89.2	.04553	82.2
.343	.34977	105.9	.04939	35.0	.33444	89.1	.04552	81.7
.344	.35082	106.0	.04940	35.1	.33544	89.0	.04551	81.2
0.345	0.35188	106.0	1.05011	35.2	0.33643	89.0	1.04550	80.6
.346	.35295	106.0	.05012	35.3	.33743	88.9	.04549	80.1
.347	.35401	106.1	.05013	35.4	.33843	88.9	.04548	79.6
.348	.35507	106.1	.05014	35.5	.33943	88.8	.04547	79.1
.349	.35613	106.2	.05015	35.6	.34043	88.7	.04546	78.6
0.350	0.35719	106.2	1.05088	35.7	0.34142	88.7	1.04545	78.1
u	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$	$\tanh u$	$= F_3'$	$\coth u$	$= F_4'$

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
0.350	0.35719	106.2	1.06188	35.7	0.33638	88.7	2.0930	78.4
.351	.35845	106.2	.00022	35.8	.33720	88.6	.0051	77.0
.352	.35971	106.3	.00050	35.9	.33805	88.6	.00521	77.5
.353	.36098	106.3	.00078	36.0	.33893	88.5	.0100	77.0
.354	.36224	106.3	.00112	36.1	.33982	88.4	.0119	76.5
0.355	0.36350	106.4	1.06368	36.3	0.34066	88.4	2.0343	76.1
.356	.36477	106.4	.00140	36.4	.34150	88.3	.0107	75.7
.357	.36603	106.4	.00170	36.5	.34237	88.3	.0101	75.2
.358	.36730	106.5	.00207	36.6	.34325	88.2	.0116	74.8
.359	.36856	106.5	.00241	36.7	.34413	88.1	.0204	74.3
0.360	0.36983	106.6	1.06550	36.8	0.34501	88.1	2.8668	73.0
.361	.37109	106.6	.00270	36.9	.34589	88.0	.8894	73.5
.362	.37236	106.6	.00302	37.0	.34677	88.0	.8821	73.1
.363	.37362	106.7	.00336	37.1	.34765	87.9	.8748	72.6
.364	.37489	106.7	.00368	37.2	.34853	87.8	.8675	72.2
0.365	0.37616	106.7	1.06736	37.3	0.34941	87.8	2.8603	71.8
.366	.37743	106.8	.00373	37.4	.35029	87.7	.8532	71.4
.367	.37869	106.8	.00410	37.5	.35116	87.7	.8460	71.0
.368	.37996	106.8	.00448	37.6	.35204	87.6	.8389	70.6
.369	.38123	106.9	.00486	37.7	.35292	87.5	.8319	70.2
0.370	0.38250	106.9	1.06923	37.9	0.35380	87.5	2.8240	69.8
.371	.38377	107.0	.00504	38.0	.35467	87.4	.8260	69.4
.372	.38503	107.0	.00542	38.1	.35554	87.4	.8180	69.0
.373	.38630	107.0	.00580	38.2	.35641	87.3	.8112	68.6
.374	.38757	107.1	.00617	38.3	.35729	87.2	.8043	68.2
0.375	0.38884	107.1	1.07111	38.4	0.35816	87.2	2.7965	67.9
.376	.39011	107.2	.00655	38.5	.35903	87.1	.7897	67.5
.377	.39138	107.2	.00693	38.6	.36000	87.0	.7829	67.1
.378	.39265	107.2	.00730	38.7	.36087	87.0	.7763	66.7
.379	.39392	107.3	.00768	38.8	.36181	86.9	.7697	66.4
0.380	0.39519	107.3	1.07307	38.9	0.36271	86.8	2.7520	66.0
.381	.39646	107.3	.00803	39.0	.36358	86.8	.7555	65.7
.382	.39773	107.4	.00838	39.1	.36444	86.7	.7490	65.3
.383	.39900	107.4	.00874	39.2	.36531	86.7	.7425	64.9
.384	.40027	107.5	.00910	39.3	.36618	86.6	.7360	64.6
0.385	0.40154	107.5	1.07503	39.5	0.36704	86.5	2.7245	64.2
.386	.40281	107.5	.00951	39.6	.36791	86.5	.7181	63.9
.387	.40408	107.6	.00987	39.7	.36877	86.4	.7117	63.5
.388	.40535	107.6	.01022	39.8	.36963	86.3	.7053	63.2
.389	.40662	107.7	.01058	39.9	.37050	86.3	.6991	62.8
0.390	0.40789	107.7	1.07700	40.0	0.37136	86.2	2.6928	62.5
.391	.40916	107.7	.01092	40.1	.37222	86.1	.6866	62.2
.392	.41043	107.8	.01128	40.2	.37308	86.1	.6803	61.8
.393	.41170	107.8	.01164	40.3	.37394	86.0	.6741	61.5
.394	.41297	107.9	.01200	40.4	.37480	86.0	.6681	61.2
0.395	0.41424	107.9	1.07903	40.5	0.37566	85.9	2.6620	60.9
.396	.41551	107.9	.01236	40.6	.37652	85.8	.6559	60.5
.397	.41678	108.0	.01271	40.7	.37738	85.8	.6499	60.2
.398	.41805	108.0	.01307	40.8	.37824	85.7	.6438	59.9
.399	.41932	108.1	.01343	40.9	.37909	85.6	.6379	59.6
0.400	0.42059	108.1	1.08107	41.1	0.37995	85.6	2.6359	59.3
u	tanh u	= F ₁ '	coth u	= F ₂ '	sinh u	= F ₃ '	coth u	= F ₄ '

Natural Hyperbolic Functions.

u	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$
0.400	0.41075	1.0811	0.38007	2.63109	0.41075	1.0811	0.38007	2.63109
.401	.41181	1.0812	.38018	2.6309	.41181	1.0812	.38018	2.6309
.402	.41284	1.0813	.38029	2.6308	.41284	1.0813	.38029	2.6308
.403	.41388	1.0814	.38040	2.6307	.41388	1.0814	.38040	2.6307
.404	.41491	1.0815	.38051	2.6306	.41491	1.0815	.38051	2.6306
0.405	0.41606	1.0816	0.38062	2.6305	0.41606	1.0816	0.38062	2.6305
.406	.41725	1.0817	.38073	2.6304	.41725	1.0817	.38073	2.6304
.407	.41843	1.0818	.38084	2.6303	.41843	1.0818	.38084	2.6303
.408	.41961	1.0819	.38095	2.6302	.41961	1.0819	.38095	2.6302
.409	.42080	1.0820	.38106	2.6301	.42080	1.0820	.38106	2.6301
0.410	0.42198	1.0821	0.38117	2.6300	0.42198	1.0821	0.38117	2.6300
.411	.42317	1.0822	.38128	2.6299	.42317	1.0822	.38128	2.6299
.412	.42436	1.0823	.38139	2.6298	.42436	1.0823	.38139	2.6298
.413	.42554	1.0824	.38150	2.6297	.42554	1.0824	.38150	2.6297
.414	.42673	1.0825	.38161	2.6296	.42673	1.0825	.38161	2.6296
0.415	0.42792	1.0826	0.38172	2.6295	0.42792	1.0826	0.38172	2.6295
.416	.42910	1.0827	.38183	2.6294	.42910	1.0827	.38183	2.6294
.417	.43029	1.0828	.38194	2.6293	.43029	1.0828	.38194	2.6293
.418	.43148	1.0829	.38205	2.6292	.43148	1.0829	.38205	2.6292
.419	.43267	1.0830	.38216	2.6291	.43267	1.0830	.38216	2.6291
0.420	0.43386	1.0831	0.38227	2.6290	0.43386	1.0831	0.38227	2.6290
.421	.43505	1.0832	.38238	2.6289	.43505	1.0832	.38238	2.6289
.422	.43624	1.0833	.38249	2.6288	.43624	1.0833	.38249	2.6288
.423	.43743	1.0834	.38260	2.6287	.43743	1.0834	.38260	2.6287
.424	.43862	1.0835	.38271	2.6286	.43862	1.0835	.38271	2.6286
0.425	0.43981	1.0836	0.38282	2.6285	0.43981	1.0836	0.38282	2.6285
.426	.44100	1.0837	.38293	2.6284	.44100	1.0837	.38293	2.6284
.427	.44219	1.0838	.38304	2.6283	.44219	1.0838	.38304	2.6283
.428	.44338	1.0839	.38315	2.6282	.44338	1.0839	.38315	2.6282
.429	.44457	1.0840	.38326	2.6281	.44457	1.0840	.38326	2.6281
0.430	0.44576	1.0841	0.38337	2.6280	0.44576	1.0841	0.38337	2.6280
.431	.44695	1.0842	.38348	2.6279	.44695	1.0842	.38348	2.6279
.432	.44814	1.0843	.38359	2.6278	.44814	1.0843	.38359	2.6278
.433	.44933	1.0844	.38370	2.6277	.44933	1.0844	.38370	2.6277
.434	.45052	1.0845	.38381	2.6276	.45052	1.0845	.38381	2.6276
0.435	0.45171	1.0846	0.38392	2.6275	0.45171	1.0846	0.38392	2.6275
.436	.45290	1.0847	.38403	2.6274	.45290	1.0847	.38403	2.6274
.437	.45409	1.0848	.38414	2.6273	.45409	1.0848	.38414	2.6273
.438	.45528	1.0849	.38425	2.6272	.45528	1.0849	.38425	2.6272
.439	.45647	1.0850	.38436	2.6271	.45647	1.0850	.38436	2.6271
0.440	0.45766	1.0851	0.38447	2.6270	0.45766	1.0851	0.38447	2.6270
.441	.45885	1.0852	.38458	2.6269	.45885	1.0852	.38458	2.6269
.442	.46004	1.0853	.38469	2.6268	.46004	1.0853	.38469	2.6268
.443	.46123	1.0854	.38480	2.6267	.46123	1.0854	.38480	2.6267
.444	.46242	1.0855	.38491	2.6266	.46242	1.0855	.38491	2.6266
0.445	0.46361	1.0856	0.38502	2.6265	0.46361	1.0856	0.38502	2.6265
.446	.46480	1.0857	.38513	2.6264	.46480	1.0857	.38513	2.6264
.447	.46599	1.0858	.38524	2.6263	.46599	1.0858	.38524	2.6263
.448	.46718	1.0859	.38535	2.6262	.46718	1.0859	.38535	2.6262
.449	.46837	1.0860	.38546	2.6261	.46837	1.0860	.38546	2.6261
0.450	0.46956	1.0861	0.38557	2.6260	0.46956	1.0861	0.38557	2.6260

Natural Hyperbolic Functions.

u	$\sinh u$	$= F'$	$\cosh u$	$= F'$	$\tanh u$	$= F'$	$\coth u$	$= F'$
0.500	0.52110	112.8	1.12763	52.1	0.46212	78.6	2.1659	36.8
.501	.52222	112.9	1.12815	52.2	.46300	78.6	.1663	37.7
.502	.52335	113.0	1.12867	52.3	.46389	78.5	.1666	38.5
.503	.52448	113.0	1.12919	52.4	.46477	78.4	.1530	39.4
.504	.52561	113.0	1.12972	52.5	.46565	78.4	.1403	39.2
0.505	0.52674	113.0	1.13025	52.7	0.46654	78.3	2.1487	39.0
.506	.52787	113.1	1.13077	52.8	.46742	78.2	.1421	38.9
.507	.52900	113.1	1.13130	52.9	.46830	78.1	.1386	38.7
.508	.53013	113.2	1.13183	53.0	.46918	78.1	.1350	38.6
.509	.53127	113.2	1.13236	53.1	.46997	78.0	.1314	38.4
0.510	0.53240	113.3	1.13289	53.2	0.47085	77.9	2.1279	38.3
.511	.53353	113.3	1.13343	53.4	.47172	77.9	.1244	38.1
.512	.53466	113.4	1.13395	53.5	.47259	77.8	.1209	38.0
.513	.53580	113.4	1.13450	53.6	.47346	77.7	.1174	37.8
.514	.53693	113.5	1.13503	53.7	.47434	77.6	.1139	37.7
0.515	0.53807	113.6	1.13557	53.8	0.47523	77.5	2.1105	37.5
.516	.53920	113.6	1.13611	53.9	.47610	77.5	.1070	37.4
.517	.54034	113.7	1.13665	54.0	.47698	77.4	.1035	37.3
.518	.54148	113.7	1.13719	54.1	.47785	77.3	.1002	37.1
.519	.54262	113.8	1.13773	54.3	.47873	77.3	.0968	37.0
0.520	0.54375	113.8	1.13827	54.4	0.47960	77.2	2.0934	36.8
.521	.54489	113.9	1.13882	54.5	.48047	77.1	.0900	36.7
.522	.54603	113.9	1.13936	54.6	.48134	77.0	.0866	36.5
.523	.54717	114.0	1.13991	54.7	.48221	77.0	.0833	36.4
.524	.54831	114.0	1.14046	54.8	.48308	76.9	.0799	36.3
0.525	0.54945	114.1	1.14101	54.9	0.48395	76.8	2.0766	36.1
.526	.55059	114.2	1.14155	55.1	.48482	76.7	.0733	36.0
.527	.55173	114.2	1.14211	55.2	.48569	76.7	.0700	35.9
.528	.55288	114.3	1.14265	55.3	.48656	76.6	.0668	35.7
.529	.55402	114.3	1.14321	55.4	.48743	76.5	.0635	35.6
0.530	0.55516	114.4	1.14377	55.5	0.48830	76.4	2.0632	35.4
.531	.55631	114.4	1.14432	55.6	.48917	76.4	.0597	35.3
.532	.55745	114.5	1.14488	55.7	.49004	76.3	.0563	35.2
.533	.55860	114.5	1.14544	55.8	.49091	76.2	.0530	35.0
.534	.55974	114.6	1.14600	56.0	.49178	76.1	.0497	34.9
0.535	0.56088	114.7	1.14656	56.1	0.49265	76.1	2.0498	34.8
.536	.56204	114.7	1.14712	56.2	.49352	76.0	.0460	34.7
.537	.56318	114.8	1.14768	56.3	.49439	75.9	.0427	34.5
.538	.56433	114.8	1.14825	56.4	.49526	75.8	.0394	34.4
.539	.56548	114.9	1.14881	56.5	.49613	75.8	.0360	34.3
0.540	0.56663	114.9	1.14938	56.7	0.49700	75.7	2.0364	34.1
.541	.56778	115.0	1.14994	56.8	.49787	75.6	.0323	34.0
.542	.56893	115.1	1.15051	56.9	.49874	75.5	.0282	33.9
.543	.57008	115.1	1.15108	57.0	.49961	75.5	.0247	33.8
.544	.57123	115.2	1.15165	57.1	.50048	75.4	.0211	33.6
0.545	0.57238	115.2	1.15223	57.2	0.50135	75.3	2.0130	33.5
.546	.57354	115.3	1.15280	57.4	.50222	75.2	.0180	33.4
.547	.57469	115.3	1.15337	57.5	.50309	75.2	.0140	33.3
.548	.57584	115.4	1.15395	57.6	.50396	75.1	.0100	33.2
.549	.57700	115.5	1.15452	57.7	.50483	75.0	.0060	33.0
0.550	0.57815	115.5	1.15510	57.8	0.50569	74.9	1.0079	32.9
u	$\tanh u$	$= F'$	$\coth u$	$= F'$	$\sinh u$	$= F'$	$\cosh u$	$= F'$

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
0.600	0.63966	118.5	1.18547	63.7	0.53705	71.2	1.8520	24.7
.601	.63784	118.6	1.18610	63.8	.53776	71.4	.8596	24.6
.602	.63603	118.7	1.18674	63.9	.53847	71.6	.8571	24.5
.603	.63421	118.7	1.18738	64.0	.53918	70.9	.8547	24.4
.604	.63240	118.8	1.18802	64.1	.53989	70.9	.8522	24.3
0.605	0.63059	118.9	1.18866	64.2	0.54060	70.8	1.8498	24.2
.606	.62878	118.9	1.18931	64.4	.54131	70.7	.8474	24.1
.607	.62697	119.0	1.18995	64.5	.54201	70.6	.8450	24.0
.608	.62516	119.1	1.19060	64.6	.54272	70.5	.8426	23.9
.609	.62335	119.1	1.19124	64.7	.54342	70.5	.8402	23.8
0.610	0.62154	119.2	1.19189	64.9	0.54413	70.4	1.8378	23.8
.611	.61973	119.3	1.19254	65.0	.54483	70.3	.8354	23.7
.612	.61792	119.3	1.19319	65.1	.54553	70.2	.8331	23.6
.613	.61611	119.4	1.19384	65.2	.54624	70.2	.8307	23.5
.614	.61430	119.4	1.19449	65.3	.54694	70.1	.8284	23.4
0.615	0.61249	119.5	1.19515	65.5	0.54765	70.0	1.8260	23.3
.616	.61068	119.6	1.19580	65.6	.54835	69.9	.8236	23.3
.617	.60887	119.6	1.19645	65.7	.54906	69.9	.8214	23.2
.618	.60706	119.7	1.19710	65.8	.54977	69.8	.8191	23.1
.619	.60525	119.8	1.19775	65.9	.55047	69.7	.8168	23.0
0.620	0.60344	119.8	1.19840	66.0	0.55118	69.6	1.8145	22.9
.621	.60163	119.9	1.19905	66.2	.55188	69.5	.8122	22.8
.622	.60082	120.0	1.19970	66.3	.55259	69.5	.8099	22.8
.623	.59901	120.0	1.20035	66.4	.55329	69.4	.8076	22.7
.624	.59720	120.1	1.20100	66.5	.55399	69.3	.8054	22.6
0.625	0.59539	120.2	1.20165	66.6	0.55470	69.2	1.8031	22.5
.626	.59358	120.3	1.20230	66.8	.55540	69.2	.8009	22.4
.627	.59177	120.3	1.20295	66.9	.55611	69.1	.7986	22.4
.628	.58996	120.4	1.20360	67.0	.55681	69.0	.7964	22.3
.629	.58815	120.4	1.20425	67.1	.55752	68.9	.7942	22.2
0.630	0.58634	120.5	1.20490	67.3	0.55822	68.8	1.7919	22.1
.631	.58453	120.6	1.20555	67.4	.55893	68.8	.7897	22.0
.632	.58272	120.6	1.20620	67.5	.55963	68.7	.7875	21.9
.633	.58091	120.7	1.20685	67.6	.56034	68.6	.7853	21.9
.634	.57910	120.8	1.20750	67.7	.56104	68.6	.7832	21.8
0.635	0.57729	120.8	1.20815	67.9	0.56175	68.5	1.7810	21.7
.636	.57548	120.9	1.20880	68.0	.56245	68.4	.7788	21.6
.637	.57367	121.0	1.20945	68.1	.56316	68.3	.7767	21.6
.638	.57186	121.1	1.21010	68.2	.56386	68.2	.7745	21.5
.639	.57005	121.1	1.21075	68.3	.56457	68.2	.7724	21.4
0.640	0.56824	121.2	1.21140	68.5	0.56527	68.1	1.7702	21.3
.641	.56643	121.3	1.21205	68.6	.56598	68.0	.7681	21.3
.642	.56462	121.3	1.21270	68.7	.56668	67.9	.7660	21.2
.643	.56281	121.4	1.21335	68.8	.56739	67.9	.7639	21.1
.644	.56100	121.5	1.21400	68.9	.56809	67.8	.7618	21.0
0.645	0.55919	121.5	1.21465	69.1	0.56880	67.7	1.7597	21.0
.646	.55738	121.6	1.21530	69.2	.56950	67.6	.7576	20.9
.647	.55557	121.7	1.21595	69.3	.57021	67.6	.7555	20.8
.648	.55376	121.7	1.21660	69.4	.57091	67.5	.7534	20.7
.649	.55195	121.8	1.21725	69.6	.57162	67.4	.7513	20.7
0.650	0.55014	121.9	1.21790	69.7	0.57232	67.3	1.7493	20.6
u	tan gd u	= F ₁ '	sec gd u	= F ₂ '	sin gd u	= F ₃ '	cos gd u	= F ₄ '

Natural Hyperbolic Functions.

u	sinh u	= F'	cosh u	= F'	tanh u	= F'	cath u	= F'
0.700	0.75898	125.5	1.25517	75.0	0.60437	63.5	1.6546	17.4
.701	.75925	125.6	.25593	75.0	.60500	63.4	.6550	17.3
.702	.75951	125.7	.25669	75.1	.60564	63.3	.6552	17.3
.703	.75978	125.7	.25745	75.2	.60627	63.2	.6554	17.2
.704	.76004	125.8	.25821	75.4	.60690	63.2	.6557	17.1
0.705	0.76031	125.9	1.25898	76.5	0.60753	63.1	1.6560	17.1
.706	.76058	126.0	.25974	76.6	.60816	63.0	.6562	17.0
.707	.76084	126.1	.26051	76.7	.60879	62.9	.6565	17.0
.708	.76111	126.1	.26128	76.9	.60942	62.9	.6568	16.9
.709	.76137	126.2	.26205	77.0	.61005	62.8	.6570	16.9
0.710	0.76164	126.3	1.25974	77.1	0.61068	62.7	1.6573	16.8
.711	.76191	126.4	.26051	77.2	.61130	62.6	.6575	16.8
.712	.76217	126.5	.26128	77.4	.61193	62.6	.6578	16.7
.713	.76244	126.5	.26205	77.5	.61256	62.5	.6580	16.7
.714	.76270	126.6	.26282	77.6	.61318	62.4	.6583	16.6
0.715	0.76297	126.7	1.26051	77.7	0.61380	62.3	1.6586	16.5
.716	.76324	126.7	.26128	77.9	.61443	62.2	.6588	16.5
.717	.76350	126.8	.26205	78.0	.61506	62.2	.6591	16.4
.718	.76377	126.9	.26282	78.1	.61569	62.1	.6594	16.4
.719	.76403	127.0	.26359	78.3	.61632	62.0	.6596	16.3
0.720	0.76430	127.1	1.26128	78.4	0.61694	61.9	1.6599	16.3
.721	.76457	127.1	.26205	78.5	.61757	61.8	.6601	16.2
.722	.76483	127.2	.26282	78.6	.61820	61.8	.6604	16.2
.723	.76510	127.3	.26359	78.8	.61883	61.7	.6607	16.1
.724	.76536	127.4	.26436	78.9	.61946	61.6	.6610	16.1
0.725	0.76563	127.5	1.26205	79.0	0.62009	61.5	1.6613	16.0
.726	.76590	127.5	.26282	79.1	.62072	61.5	.6615	16.0
.727	.76616	127.6	.26359	79.3	.62135	61.4	.6618	15.9
.728	.76643	127.7	.26436	79.4	.62198	61.3	.6621	15.9
.729	.76669	127.8	.26513	79.5	.62261	61.3	.6624	15.8
0.730	0.76696	127.8	1.26282	79.7	0.62324	61.2	1.6627	15.8
.731	.76723	127.9	.26359	79.8	.62387	61.1	.6629	15.7
.732	.76749	128.0	.26436	79.9	.62450	61.0	.6632	15.7
.733	.76776	128.1	.26513	80.0	.62513	61.0	.6635	15.6
.734	.76802	128.2	.26590	80.2	.62576	60.9	.6638	15.6
0.735	0.76829	128.2	1.26359	80.3	0.62639	60.8	1.6641	15.5
.736	.76855	128.3	.26436	80.4	.62702	60.7	.6644	15.5
.737	.76882	128.4	.26513	80.6	.62765	60.6	.6647	15.4
.738	.76908	128.5	.26590	80.7	.62828	60.6	.6650	15.4
.739	.76935	128.6	.26667	80.8	.62891	60.5	.6653	15.3
0.740	0.76961	128.7	1.26436	80.9	0.62954	60.4	1.6656	15.3
.741	.76988	128.7	.26513	81.1	.63017	60.3	.6659	15.2
.742	.77014	128.8	.26590	81.2	.63080	60.3	.6662	15.2
.743	.77041	128.9	.26667	81.3	.63143	60.2	.6665	15.1
.744	.77067	129.0	.26744	81.5	.63206	60.1	.6668	15.1
0.745	0.77094	129.1	1.26513	81.6	0.63269	60.0	1.6671	15.0
.746	.77120	129.1	.26590	81.7	.63332	60.0	.6674	15.0
.747	.77147	129.2	.26667	81.8	.63395	59.9	.6677	14.9
.748	.77173	129.3	.26744	82.0	.63458	59.8	.6680	14.9
.749	.77200	129.4	.26821	82.1	.63521	59.7	.6683	14.8
0.750	0.77226	129.5	1.26590	82.2	0.63584	59.7	1.6686	14.8
u	tan gd u	= F'	sec gd u	= F'	sin gd u	= F'	cos gd u	= F'

Natural Hyperbolic Functions.

x	$\sinh x$	$\cosh x$	$\tanh x$	$\coth x$	$\sinh x$	$\cosh x$	$\tanh x$	$\coth x$
0.750	0.82434	1.505	0.54518	1.834	0.82434	1.505	0.54518	1.834
0.751	0.82500	1.506	0.54531	1.833	0.82500	1.506	0.54531	1.833
0.752	0.82566	1.507	0.54544	1.832	0.82566	1.507	0.54544	1.832
0.753	0.82632	1.508	0.54557	1.831	0.82632	1.508	0.54557	1.831
0.754	0.82698	1.509	0.54570	1.830	0.82698	1.509	0.54570	1.830
0.755	0.82764	1.510	0.54583	1.829	0.82764	1.510	0.54583	1.829
0.756	0.82830	1.511	0.54596	1.828	0.82830	1.511	0.54596	1.828
0.757	0.82896	1.512	0.54609	1.827	0.82896	1.512	0.54609	1.827
0.758	0.82962	1.513	0.54622	1.826	0.82962	1.513	0.54622	1.826
0.759	0.83028	1.514	0.54635	1.825	0.83028	1.514	0.54635	1.825
0.760	0.83094	1.515	0.54648	1.824	0.83094	1.515	0.54648	1.824
0.761	0.83160	1.516	0.54661	1.823	0.83160	1.516	0.54661	1.823
0.762	0.83226	1.517	0.54674	1.822	0.83226	1.517	0.54674	1.822
0.763	0.83292	1.518	0.54687	1.821	0.83292	1.518	0.54687	1.821
0.764	0.83358	1.519	0.54700	1.820	0.83358	1.519	0.54700	1.820
0.765	0.83424	1.520	0.54713	1.819	0.83424	1.520	0.54713	1.819
0.766	0.83490	1.521	0.54726	1.818	0.83490	1.521	0.54726	1.818
0.767	0.83556	1.522	0.54739	1.817	0.83556	1.522	0.54739	1.817
0.768	0.83622	1.523	0.54752	1.816	0.83622	1.523	0.54752	1.816
0.769	0.83688	1.524	0.54765	1.815	0.83688	1.524	0.54765	1.815
0.770	0.83754	1.525	0.54778	1.814	0.83754	1.525	0.54778	1.814
0.771	0.83820	1.526	0.54791	1.813	0.83820	1.526	0.54791	1.813
0.772	0.83886	1.527	0.54804	1.812	0.83886	1.527	0.54804	1.812
0.773	0.83952	1.528	0.54817	1.811	0.83952	1.528	0.54817	1.811
0.774	0.84018	1.529	0.54830	1.810	0.84018	1.529	0.54830	1.810
0.775	0.84084	1.530	0.54843	1.809	0.84084	1.530	0.54843	1.809
0.776	0.84150	1.531	0.54856	1.808	0.84150	1.531	0.54856	1.808
0.777	0.84216	1.532	0.54869	1.807	0.84216	1.532	0.54869	1.807
0.778	0.84282	1.533	0.54882	1.806	0.84282	1.533	0.54882	1.806
0.779	0.84348	1.534	0.54895	1.805	0.84348	1.534	0.54895	1.805
0.780	0.84414	1.535	0.54908	1.804	0.84414	1.535	0.54908	1.804
0.781	0.84480	1.536	0.54921	1.803	0.84480	1.536	0.54921	1.803
0.782	0.84546	1.537	0.54934	1.802	0.84546	1.537	0.54934	1.802
0.783	0.84612	1.538	0.54947	1.801	0.84612	1.538	0.54947	1.801
0.784	0.84678	1.539	0.54960	1.800	0.84678	1.539	0.54960	1.800
0.785	0.84744	1.540	0.54973	1.799	0.84744	1.540	0.54973	1.799
0.786	0.84810	1.541	0.54986	1.798	0.84810	1.541	0.54986	1.798
0.787	0.84876	1.542	0.54999	1.797	0.84876	1.542	0.54999	1.797
0.788	0.84942	1.543	0.55012	1.796	0.84942	1.543	0.55012	1.796
0.789	0.85008	1.544	0.55025	1.795	0.85008	1.544	0.55025	1.795
0.790	0.85074	1.545	0.55038	1.794	0.85074	1.545	0.55038	1.794
0.791	0.85140	1.546	0.55051	1.793	0.85140	1.546	0.55051	1.793
0.792	0.85206	1.547	0.55064	1.792	0.85206	1.547	0.55064	1.792
0.793	0.85272	1.548	0.55077	1.791	0.85272	1.548	0.55077	1.791
0.794	0.85338	1.549	0.55090	1.790	0.85338	1.549	0.55090	1.790
0.795	0.85404	1.550	0.55103	1.789	0.85404	1.550	0.55103	1.789
0.796	0.85470	1.551	0.55116	1.788	0.85470	1.551	0.55116	1.788
0.797	0.85536	1.552	0.55129	1.787	0.85536	1.552	0.55129	1.787
0.798	0.85602	1.553	0.55142	1.786	0.85602	1.553	0.55142	1.786
0.799	0.85668	1.554	0.55155	1.785	0.85668	1.554	0.55155	1.785
0.800	0.85734	1.555	0.55168	1.784	0.85734	1.555	0.55168	1.784
x	$\sinh x$	$\cosh x$	$\tanh x$	$\coth x$	x	$\sinh x$	$\cosh x$	$\tanh x$

Natural Hyperbolic Functions.

u	sinh u	= F ₂ '	cosh u	= F ₂ '	tanh u	= F ₂ '	coth u	= F ₂ '
0.800	0.88811	133.7	1.32743	88.8	0.66404	53.0	1.5099	12.7
.801	.88944	133.8	.32832	88.9	.66460	53.1	.5047	12.6
.802	.89078	133.9	.32921	89.1	.66515	53.2	.5034	12.6
.803	.89212	134.0	.33011	89.2	.66571	53.3	.5022	12.6
.804	.89346	134.1	.33100	89.3	.66627	53.0	.5009	12.5
0.805	0.89480	134.2	1.34189	89.5	0.66682	53.5	1.4995	12.5
.806	.89615	134.3	.34279	89.6	.66738	53.5	.4984	12.5
.807	.89749	134.4	.34368	89.7	.66793	53.4	.4972	12.4
.808	.89883	134.5	.34458	89.8	.66849	53.3	.4959	12.4
.809	.89918	134.5	.34548	90.0	.66904	53.2	.4947	12.3
0.810	0.90152	134.6	1.34638	90.2	0.66959	53.2	1.4933	12.3
.811	.90287	134.7	.34729	90.3	.67014	53.1	.4922	12.3
.812	.90422	134.8	.34819	90.4	.67069	53.0	.4910	12.2
.813	.90557	134.9	.34909	90.5	.67124	53.0	.4898	12.2
.814	.90692	135.0	.35000	90.7	.67179	53.0	.4886	12.2
0.815	0.90827	135.1	1.35091	90.8	0.67234	53.8	1.4873	12.1
.816	.90962	135.2	.35182	91.0	.67289	53.7	.4861	12.1
.817	.91097	135.3	.35273	91.1	.67343	53.6	.4849	12.0
.818	.91232	135.4	.35364	91.2	.67398	53.6	.4837	12.0
.819	.91368	135.5	.35455	91.4	.67453	53.5	.4825	12.0
0.820	0.91503	135.5	1.35547	91.5	0.67507	53.4	1.4813	11.9
.821	.91639	135.6	.35638	91.6	.67561	53.4	.4801	11.9
.822	.91775	135.7	.35729	91.8	.67616	53.3	.4789	11.9
.823	.91910	135.8	.35822	91.9	.67670	53.2	.4778	11.8
.824	.92046	135.9	.35914	92.0	.67724	53.1	.4766	11.8
0.825	0.92182	136.0	1.36006	92.2	0.67778	53.1	1.4754	11.8
.826	.92318	136.1	.36098	92.3	.67832	53.0	.4742	11.7
.827	.92454	136.2	.36190	92.5	.67886	53.0	.4731	11.7
.828	.92591	136.3	.36283	92.6	.67940	53.8	.4719	11.7
.829	.92727	136.4	.36376	92.7	.67994	53.8	.4707	11.6
0.830	0.92863	136.5	1.36468	92.8	0.68048	53.7	1.4695	11.6
.831	.93000	136.6	.36561	93.0	.68101	53.6	.4684	11.6
.832	.93137	136.7	.36654	93.1	.68155	53.5	.4672	11.5
.833	.93273	136.7	.36748	93.3	.68208	53.5	.4661	11.5
.834	.93410	136.8	.36841	93.4	.68262	53.4	.4649	11.5
0.835	0.93547	136.9	1.36934	93.5	0.68315	53.3	1.4638	11.4
.836	.93684	137.0	.37026	93.7	.68368	53.3	.4627	11.4
.837	.93821	137.1	.37122	93.8	.68421	53.2	.4615	11.4
.838	.93958	137.2	.37216	94.0	.68473	53.1	.4604	11.3
.839	.94095	137.3	.37310	94.1	.68526	53.0	.4593	11.3
0.840	0.94233	137.4	1.37404	94.2	0.68581	53.0	1.4581	11.3
.841	.94370	137.5	.37498	94.4	.68634	52.9	.4570	11.2
.842	.94508	137.6	.37593	94.5	.68687	52.8	.4558	11.2
.843	.94645	137.7	.37687	94.6	.68740	52.7	.4546	11.2
.844	.94783	137.8	.37782	94.8	.68793	52.7	.4535	11.1
0.845	0.94921	137.9	1.37877	94.9	0.68845	52.6	1.4525	11.1
.846	.95059	138.0	.37972	95.1	.68897	52.5	.4514	11.1
.847	.95197	138.1	.38067	95.2	.68950	52.5	.4503	11.0
.848	.95335	138.2	.38162	95.3	.69003	52.4	.4492	11.0
.849	.95473	138.3	.38258	95.5	.69055	52.3	.4481	11.0
0.850	0.95612	138.4	1.38353	95.6	0.69107	52.2	1.4470	10.9
u	lnh of u	= F ₂ '	cos of u	= F ₂ '	sin of u	= F ₂ '	sec of u	= F ₂ '

Natural Hyperbolic Functions.

n	$\sin \alpha$	$\cos \alpha$	$\tan \alpha$	$\cot \alpha$	$\sec \alpha$	$\csc \alpha$
0.000	1.00000	1.00000	0.00000	∞	1.00000	1.00000
0.001	0.99999	0.99999	0.00100	1.00000	1.00001	0.99999
0.002	0.99996	0.99996	0.00200	0.99999	1.00004	0.99996
0.003	0.99991	0.99991	0.00300	0.99991	1.00009	0.99991
0.004	0.99984	0.99984	0.00400	0.99984	1.00016	0.99984
0.005	0.99976	0.99976	0.00500	0.99976	1.00025	0.99976
0.006	0.99966	0.99966	0.00600	0.99966	1.00036	0.99966
0.007	0.99955	0.99955	0.00700	0.99955	1.00049	0.99955
0.008	0.99942	0.99942	0.00800	0.99942	1.00064	0.99942
0.009	0.99928	0.99928	0.00900	0.99928	1.00081	0.99928
0.010	0.99913	0.99913	0.01000	0.99913	1.00100	0.99913
0.011	0.99896	0.99896	0.01100	0.99896	1.00121	0.99896
0.012	0.99878	0.99878	0.01200	0.99878	1.00144	0.99878
0.013	0.99858	0.99858	0.01300	0.99858	1.00169	0.99858
0.014	0.99837	0.99837	0.01400	0.99837	1.00195	0.99837
0.015	0.99814	0.99814	0.01500	0.99814	1.00223	0.99814
0.016	0.99790	0.99790	0.01600	0.99790	1.00252	0.99790
0.017	0.99764	0.99764	0.01700	0.99764	1.00283	0.99764
0.018	0.99737	0.99737	0.01800	0.99737	1.00315	0.99737
0.019	0.99709	0.99709	0.01900	0.99709	1.00349	0.99709
0.020	0.99680	0.99680	0.02000	0.99680	1.00384	0.99680
0.021	0.99649	0.99649	0.02100	0.99649	1.00420	0.99649
0.022	0.99617	0.99617	0.02200	0.99617	1.00458	0.99617
0.023	0.99584	0.99584	0.02300	0.99584	1.00497	0.99584
0.024	0.99549	0.99549	0.02400	0.99549	1.00538	0.99549
0.025	0.99513	0.99513	0.02500	0.99513	1.00580	0.99513
0.026	0.99476	0.99476	0.02600	0.99476	1.00624	0.99476
0.027	0.99438	0.99438	0.02700	0.99438	1.00669	0.99438
0.028	0.99398	0.99398	0.02800	0.99398	1.00716	0.99398
0.029	0.99357	0.99357	0.02900	0.99357	1.00764	0.99357
0.030	0.99314	0.99314	0.03000	0.99314	1.00814	0.99314
0.031	0.99270	0.99270	0.03100	0.99270	1.00865	0.99270
0.032	0.99225	0.99225	0.03200	0.99225	1.00918	0.99225
0.033	0.99179	0.99179	0.03300	0.99179	1.00972	0.99179
0.034	0.99132	0.99132	0.03400	0.99132	1.01028	0.99132
0.035	0.99084	0.99084	0.03500	0.99084	1.01085	0.99084
0.036	0.99035	0.99035	0.03600	0.99035	1.01144	0.99035
0.037	0.98984	0.98984	0.03700	0.98984	1.01204	0.98984
0.038	0.98932	0.98932	0.03800	0.98932	1.01266	0.98932
0.039	0.98879	0.98879	0.03900	0.98879	1.01329	0.98879
0.040	0.98824	0.98824	0.04000	0.98824	1.01394	0.98824
0.041	0.98768	0.98768	0.04100	0.98768	1.01460	0.98768
0.042	0.98711	0.98711	0.04200	0.98711	1.01528	0.98711
0.043	0.98653	0.98653	0.04300	0.98653	1.01597	0.98653
0.044	0.98594	0.98594	0.04400	0.98594	1.01668	0.98594
0.045	0.98534	0.98534	0.04500	0.98534	1.01740	0.98534</

Natural Hyperbolic Functions.

x	$\sinh x$	$\cosh x$	$\tanh x$	$\operatorname{sech} x$	$\coth x$	$\operatorname{csch} x$	$\operatorname{csch}^2 x$	
0.050	1.050048	1.40	1.48523	110	0.73078	45.3	1.3517	8.3
.051	1.050097	1.40	1.48533	110	74024	45.2	1.3509	8.2
.052	1.050146	1.40	1.48543	110	74059	45.1	1.3501	8.2
.053	1.050195	1.40	1.48553	110	74114	45.1	1.3493	8.2
.054	1.050244	1.40	1.48564	111	74189	45.0	1.3485	8.2
0.055	1.050293	1.40	1.48574	111	0.74204	44.9	1.3476	8.2
.056	1.050342	1.40	1.48585	111	74249	44.9	1.3468	8.1
.057	1.050391	1.40	1.48595	111	74294	44.8	1.3460	8.1
.058	1.050441	1.40	1.48607	111	74338	44.7	1.3452	8.1
.059	1.050490	1.40	1.48618	111	74383	44.7	1.3444	8.1
0.060	1.050540	1.40	1.48629	111	0.74428	44.6	1.3436	8.1
.061	1.050589	1.40	1.48641	112	74472	44.5	1.3428	8.0
.062	1.050639	1.40	1.48653	112	74517	44.5	1.3420	8.0
.063	1.050689	1.40	1.48664	112	74561	44.4	1.3412	8.0
.064	1.050739	1.40	1.48676	112	74606	44.3	1.3404	8.0
0.065	1.050789	1.40	1.48688	112	0.74650	44.3	1.3396	7.9
.066	1.050839	1.40	1.48699	112	74694	44.2	1.3388	7.9
.067	1.050889	1.41	1.48711	112	74738	44.1	1.3380	7.9
.068	1.050939	1.41	1.48723	113	74782	44.1	1.3372	7.9
.069	1.050989	1.41	1.48735	113	74826	44.0	1.3364	7.9
0.070	1.051039	1.41	1.48747	113	0.74870	43.9	1.3356	7.8
.071	1.051089	1.41	1.48759	113	74914	43.9	1.3348	7.8
.072	1.051139	1.41	1.48771	113	74958	43.8	1.3341	7.8
.073	1.051189	1.41	1.48783	113	75002	43.7	1.3333	7.8
.074	1.051239	1.41	1.48795	114	75046	43.7	1.3325	7.8
0.075	1.051289	1.41	1.48807	114	0.75090	43.6	1.3317	7.7
.076	1.051339	1.41	1.48819	114	75133	43.6	1.3310	7.7
.077	1.051389	1.41	1.48831	114	75177	43.5	1.3302	7.7
.078	1.051439	1.41	1.48843	114	75220	43.4	1.3294	7.7
.079	1.051489	1.41	1.48855	114	75263	43.4	1.3287	7.7
0.080	1.051539	1.41	1.48867	114	0.75307	43.3	1.3279	7.6
.081	1.051589	1.41	1.48879	115	75350	43.2	1.3271	7.6
.082	1.051639	1.41	1.48891	115	75393	43.2	1.3264	7.6
.083	1.051689	1.41	1.48903	115	75436	43.1	1.3256	7.6
.084	1.051739	1.41	1.48915	115	75479	43.0	1.3249	7.6
0.085	1.051789	1.41	1.48927	115	0.75522	43.0	1.3241	7.5
.086	1.051839	1.41	1.48939	115	75565	42.9	1.3234	7.5
.087	1.051889	1.41	1.48951	116	75608	42.8	1.3226	7.5
.088	1.051939	1.41	1.48963	116	75651	42.8	1.3219	7.5
.089	1.051989	1.41	1.48975	116	75694	42.7	1.3211	7.5
0.090	1.052039	1.41	1.48987	116	0.75736	42.6	1.3204	7.4
.091	1.052089	1.41	1.48999	116	75779	42.6	1.3196	7.4
.092	1.052139	1.41	1.49011	116	75822	42.5	1.3189	7.4
.093	1.052189	1.41	1.49023	116	75865	42.4	1.3182	7.4
.094	1.052239	1.41	1.49035	117	75908	42.4	1.3174	7.4
0.095	1.052289	1.41	1.49047	117	0.75950	42.3	1.3167	7.3
.096	1.052339	1.41	1.49059	117	75993	42.3	1.3159	7.3
.097	1.052389	1.41	1.49071	117	76036	42.2	1.3152	7.3
.098	1.052439	1.41	1.49083	117	76079	42.1	1.3145	7.3
.099	1.052489	1.41	1.49095	117	76122	42.1	1.3138	7.3
1.000	1.17520	1.54	1.54308	118	0.76139	42.0	1.3130	7.2
x	$\sinh x$	$\cosh x$	$\tanh x$	$\operatorname{sech} x$	$\coth x$	$\operatorname{csch} x$	$\operatorname{csch}^2 x$	

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
1.000	1.17520	154	1.54308	118	0.76159	42.0	1.3130	7.2
.001	1.17574	154	1.54426	118	.76201	41.9	1.3123	7.2
.002	1.17629	155	1.54543	118	.76243	41.9	1.3116	7.2
.003	1.17684	155	1.54661	118	.76285	41.8	1.3109	7.2
.004	1.17738	155	1.54779	118	.76327	41.7	1.3102	7.2
1.005	1.17793	155	1.54898	118	0.76369	41.7	1.3094	7.1
.006	1.17848	155	1.55016	118	.76410	41.6	1.3087	7.1
.007	1.17903	155	1.55134	119	.76452	41.6	1.3080	7.1
.008	1.17958	155	1.55253	119	.76493	41.5	1.3073	7.1
.009	1.18014	155	1.55372	119	.76535	41.4	1.3066	7.1
1.010	1.18069	155	1.55491	119	0.76576	41.4	1.3059	7.1
.011	1.18125	156	1.55610	119	.76618	41.3	1.3052	7.0
.012	1.18180	156	1.55729	119	.76659	41.2	1.3045	7.0
.013	1.18236	156	1.55849	120	.76700	41.2	1.3038	7.0
.014	1.18292	156	1.55969	120	.76741	41.1	1.3031	7.0
1.015	1.18348	156	1.56088	120	0.76782	41.0	1.3024	7.0
.016	1.18404	156	1.56208	120	.76823	41.0	1.3017	7.0
.017	1.18460	156	1.56328	120	.76864	40.9	1.3010	6.9
.018	1.18517	156	1.56449	120	.76905	40.9	1.3003	6.9
.019	1.18573	157	1.56569	120	.76946	40.8	1.2996	6.9
1.020	1.18630	157	1.56689	121	0.76987	40.7	1.2989	6.9
.021	1.18687	157	1.56810	121	.77027	40.7	1.2982	6.9
.022	1.18744	157	1.56931	121	.77068	40.6	1.2975	6.8
.023	1.18801	157	1.57052	121	.77109	40.5	1.2969	6.8
.024	1.18858	157	1.57173	121	.77149	40.5	1.2962	6.8
1.025	1.18915	157	1.57294	121	0.77190	40.4	1.2955	6.8
.026	1.18972	157	1.57416	122	.77230	40.4	1.2948	6.8
.027	1.19030	158	1.57538	122	.77270	40.3	1.2942	6.7
.028	1.19087	158	1.57660	122	.77310	40.2	1.2935	6.7
.029	1.19145	158	1.57782	122	.77351	40.2	1.2928	6.7
1.030	1.19203	158	1.57904	122	0.77391	40.1	1.2921	6.7
.031	1.19261	158	1.58026	122	.77431	40.0	1.2915	6.7
.032	1.19319	158	1.58148	123	.77471	40.0	1.2908	6.7
.033	1.19377	158	1.58271	123	.77511	39.9	1.2901	6.6
.034	1.19436	158	1.58394	123	.77551	39.9	1.2895	6.6
1.035	1.19494	159	1.58517	123	0.77591	39.8	1.2888	6.6
.036	1.19553	159	1.58640	123	.77630	39.7	1.2882	6.6
.037	1.19611	159	1.58763	123	.77670	39.7	1.2875	6.6
.038	1.19670	159	1.58886	123	.77710	39.6	1.2868	6.5
.039	1.19729	159	1.59010	124	.77749	39.6	1.2862	6.5
1.040	1.19788	159	1.59134	124	0.77789	39.5	1.2855	6.5
.041	1.19847	159	1.59257	124	.77828	39.4	1.2849	6.5
.042	1.19906	159	1.59381	124	.77868	39.4	1.2842	6.5
.043	1.19965	160	1.59506	124	.77907	39.3	1.2836	6.5
.044	1.20024	160	1.59630	124	.77946	39.2	1.2829	6.5
1.045	1.20083	160	1.59755	125	0.77985	39.2	1.2823	6.4
.046	1.20143	160	1.59879	125	.78025	39.1	1.2816	6.4
.047	1.20202	160	1.60004	125	.78064	39.1	1.2810	6.4
.048	1.20262	160	1.60128	125	.78103	39.0	1.2804	6.4
.049	1.20321	160	1.60254	125	.78142	38.9	1.2797	6.4
1.050	1.20381	160	1.60379	125	0.78181	38.9	1.2791	6.4
u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '

Natural Hyperbolic Functions.

u	$\sinh u$	$u F_1'$	$\cosh u$	$u F_2'$	$\tanh u$	$u F_3'$	$\coth u$	$u F_4'$
1.100	1.33595	167	1.69852	134	0.80099	35.0	1.2492	5.6
1.101	.33732	167	.69986	134	.80203	35.0	.2487	5.6
1.102	.33890	167	.69719	134	.80122	35.8	.2481	5.6
1.103	.34066	167	.69253	134	.80157	35.7	.2475	5.6
1.104	.34233	167	.69387	134	.80193	35.7	.2470	5.5
1.105	1.34491	168	1.69522	134	0.80239	35.6	1.2464	5.5
1.106	.34598	168	.69656	135	.80264	35.6	.2459	5.5
1.107	.34736	168	.69791	135	.80300	35.5	.2453	5.5
1.108	.34904	168	.69926	135	.80335	35.5	.2448	5.5
1.109	.35072	168	.68061	135	.80371	35.4	.2442	5.5
1.110	1.35240	168	1.68196	135	0.80406	35.3	1.2437	5.5
1.111	.35408	168	.68331	135	.80442	35.3	.2431	5.5
1.112	.35577	168	.68467	135	.80477	35.2	.2426	5.4
1.113	.35745	169	.68599	135	.80512	35.2	.2421	5.4
1.114	.35914	169	.68738	135	.80547	35.1	.2415	5.4
1.115	1.36081	169	1.68874	135	0.80582	35.1	1.2410	5.4
1.116	.36252	169	.69010	135	.80617	35.0	.2404	5.4
1.117	.36421	169	.69147	135	.80652	35.0	.2399	5.4
1.118	.36590	169	.69283	137	.80687	34.9	.2394	5.4
1.119	.36759	169	.69420	137	.80722	34.8	.2388	5.3
1.120	1.36929	170	1.69557	137	0.80757	34.8	1.2383	5.3
1.121	.37098	170	.69694	137	.80792	34.7	.2378	5.3
1.122	.37268	170	.69831	137	.80826	34.7	.2372	5.3
1.123	.37438	170	.69968	137	.80861	34.6	.2367	5.3
1.124	.37608	170	.70106	138	.80896	34.6	.2362	5.3
1.125	1.37778	170	1.70243	138	0.80930	34.5	1.2356	5.3
1.126	.37947	170	.70381	138	.80965	34.4	.2351	5.3
1.127	.38116	171	.70519	138	.80999	34.4	.2346	5.2
1.128	.38286	171	.70658	138	.81033	34.3	.2341	5.2
1.129	.38456	171	.70796	138	.81068	34.3	.2335	5.2
1.130	1.38627	171	1.70934	139	0.81102	34.2	1.2330	5.2
1.131	.38796	171	.71073	139	.81136	34.2	.2325	5.2
1.132	.38967	171	.71212	139	.81170	34.1	.2320	5.2
1.133	.39137	171	.71351	139	.81204	34.1	.2315	5.2
1.134	.39310	171	.71490	139	.81238	34.0	.2309	5.2
1.135	1.39483	172	1.71629	139	0.81272	33.9	1.2304	5.1
1.136	.39656	172	.71769	140	.81306	33.9	.2299	5.1
1.137	.39831	172	.71909	140	.81340	33.8	.2294	5.1
1.138	.40003	172	.72049	140	.81374	33.8	.2289	5.1
1.139	.40175	172	.72189	140	.81408	33.7	.2284	5.1
1.140	1.40347	172	1.72329	140	0.81441	33.7	1.2279	5.1
1.141	.40520	172	.72470	141	.81475	33.6	.2274	5.1
1.142	.40692	173	.72610	141	.81509	33.6	.2269	5.1
1.143	.40865	173	.72751	141	.81542	33.5	.2264	5.0
1.144	.41038	173	.72892	141	.81576	33.5	.2259	5.0
1.145	1.41211	173	1.73033	141	0.81609	33.4	1.2254	5.0
1.146	.41384	173	.73175	141	.81642	33.3	.2249	5.0
1.147	.41557	173	.73316	142	.81676	33.3	.2244	5.0
1.148	.41731	173	.73458	142	.81709	33.2	.2239	5.0
1.149	.41904	174	.73599	142	.81742	33.2	.2234	5.0
1.150	1.42078	174	1.73741	142	0.81775	33.1	1.2229	5.0
1	$u F_1'$	$\sinh u$	$u F_2'$	$\cosh u$	$u F_3'$	$\tanh u$	$u F_4'$	$\coth u$

Natural Hyperbolic Functions.

u	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$
1.150	1.42098	171	1.73371	1.42	0.81775	31.1	1.2220	5.0
1.151	1.42152	171	1.73381	1.42	0.81809	31.1	1.2224	4.0
1.152	1.42206	171	1.73390	1.42	0.81842	31.0	1.2229	4.0
1.153	1.42260	171	1.73408	1.43	0.81875	31.0	1.2234	4.0
1.154	1.42314	171	1.73411	1.43	0.81907	31.0	1.2239	4.0
1.155	1.42368	171	1.73453	1.43	0.81940	31.0	1.2244	4.0
1.156	1.42421	171	1.73497	1.43	0.81973	31.0	1.2249	4.0
1.157	1.42475	171	1.73519	1.43	0.82006	31.0	1.2254	4.0
1.158	1.42528	171	1.73583	1.43	0.82039	31.0	1.2259	4.0
1.159	1.42582	171	1.73627	1.44	0.82071	31.0	1.2265	4.0
1.160	1.42635	171	1.73717	1.44	0.82104	31.0	1.2270	4.0
1.161	1.42688	171	1.73715	1.44	0.82137	31.0	1.2275	4.0
1.162	1.42741	171	1.73759	1.44	0.82169	31.0	1.2280	4.0
1.163	1.42794	170	1.73803	1.44	0.82202	31.0	1.2285	4.0
1.164	1.42847	170	1.73848	1.45	0.82234	31.0	1.2290	4.0
1.165	1.42900	170	1.73892	1.45	0.82266	31.0	1.2295	4.0
1.166	1.42953	170	1.73937	1.45	0.82299	31.0	1.2300	4.0
1.167	1.43006	170	1.73982	1.45	0.82331	31.0	1.2305	4.0
1.168	1.43059	170	1.74027	1.45	0.82363	31.0	1.2310	4.0
1.169	1.43112	170	1.74072	1.45	0.82395	31.0	1.2315	4.0
1.170	1.43165	170	1.74118	1.46	0.82427	31.0	1.2320	4.0
1.171	1.43218	170	1.74161	1.46	0.82459	31.0	1.2325	4.0
1.172	1.43271	170	1.74206	1.46	0.82491	31.0	1.2330	4.0
1.173	1.43324	170	1.74250	1.46	0.82523	31.0	1.2335	4.0
1.174	1.43377	170	1.74293	1.46	0.82555	31.0	1.2340	4.0
1.175	1.43430	170	1.74338	1.46	0.82587	31.0	1.2345	4.0
1.176	1.43483	170	1.74382	1.47	0.82619	31.0	1.2350	4.0
1.177	1.43536	170	1.74425	1.47	0.82650	31.0	1.2355	4.0
1.178	1.43589	170	1.74468	1.47	0.82682	31.0	1.2360	4.0
1.179	1.43642	170	1.74512	1.47	0.82714	31.0	1.2365	4.0
1.180	1.43695	170	1.74556	1.47	0.82745	31.0	1.2370	4.0
1.181	1.43748	170	1.74600	1.48	0.82777	31.0	1.2375	4.0
1.182	1.43801	170	1.74643	1.48	0.82808	31.0	1.2380	4.0
1.183	1.43854	170	1.74687	1.48	0.82840	31.0	1.2385	4.0
1.184	1.43907	170	1.74730	1.48	0.82871	31.0	1.2390	4.0
1.185	1.43960	170	1.74774	1.48	0.82902	31.0	1.2395	4.0
1.186	1.44013	170	1.74817	1.48	0.82933	31.0	1.2400	4.0
1.187	1.44066	170	1.74860	1.49	0.82965	31.0	1.2405	4.0
1.188	1.44119	170	1.74903	1.49	0.82996	31.0	1.2410	4.0
1.189	1.44172	170	1.74946	1.49	0.83027	31.0	1.2415	4.0
1.190	1.44225	170	1.74989	1.49	0.83058	31.0	1.2420	4.0
1.191	1.44278	170	1.75032	1.49	0.83089	31.0	1.2425	4.0
1.192	1.44331	170	1.75075	1.50	0.83120	31.0	1.2430	4.0
1.193	1.44384	170	1.75118	1.50	0.83151	31.0	1.2435	4.0
1.194	1.44437	170	1.75161	1.50	0.83182	31.0	1.2440	4.0
1.195	1.44490	170	1.75204	1.50	0.83213	31.0	1.2445	4.0
1.196	1.44543	170	1.75247	1.50	0.83244	31.0	1.2450	4.0
1.197	1.44596	170	1.75290	1.51	0.83275	31.0	1.2455	4.0
1.198	1.44649	170	1.75333	1.51	0.83306	31.0	1.2460	4.0
1.199	1.44702	170	1.75376	1.51	0.83337	31.0	1.2465	4.0
1.200	1.44755	170	1.75419	1.51	0.83368	31.0	1.2470	4.0
u	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$

Natural Hyperbolic Functions.

u	sinh u	= F'	cosh u	= F'	tanh u	= F'	coth u	= F'
1.200	1.90926	181	1.81066	151	0.83365	20.5	1.1905	4.4
.201	.51127	181	.81217	151	.83305	20.5	.1901	4.4
.202	.51309	181	.81308	151	.83425	20.4	.1907	4.4
.203	.51490	182	.81519	151	.83457	20.3	.1912	4.4
.204	.51672	182	.81671	152	.83487	20.3	.1918	4.3
1.205	1.51853	182	1.81823	152	0.83517	20.2	1.1924	4.3
.206	.52035	182	.81974	152	.83548	20.2	.1929	4.3
.207	.52217	182	.82127	152	.83578	20.1	.1935	4.3
.208	.52400	182	.82279	152	.83608	20.1	.1941	4.3
.209	.52582	182	.82431	153	.83638	20.0	.1946	4.3
1.210	1.52764	183	1.82584	153	0.83668	20.0	1.1952	4.3
.211	.52947	183	.82737	153	.83698	20.0	.1958	4.3
.212	.53130	183	.82890	153	.83728	20.0	.1964	4.3
.213	.53313	183	.83043	153	.83758	20.8	.1970	4.3
.214	.53496	183	.83197	153	.83788	20.8	.1975	4.2
1.215	1.53679	183	1.83350	154	0.83817	20.7	1.1981	4.2
.216	.53863	184	.83504	154	.83847	20.7	.1986	4.2
.217	.54046	184	.83658	154	.83877	20.6	.1992	4.2
.218	.54230	184	.83812	154	.83906	20.6	.1998	4.2
.219	.54414	184	.83966	154	.83936	20.5	.1994	4.2
1.220	1.54598	184	1.84119	155	0.83965	20.5	1.1999	4.2
.221	.54782	184	.84276	155	.83995	20.4	.1995	4.2
.222	.54966	184	.84430	155	.84024	20.4	.1991	4.2
.223	.55151	185	.84586	155	.84054	20.3	.1997	4.2
.224	.55336	185	.84741	155	.84083	20.3	.1993	4.1
1.225	1.55520	185	1.84896	156	0.84112	20.3	1.1999	4.1
.226	.55705	185	.85052	156	.84142	20.2	.1995	4.1
.227	.55891	185	.85208	156	.84171	20.2	.1991	4.1
.228	.56076	185	.85364	156	.84200	20.1	.1997	4.1
.229	.56261	186	.85520	156	.84229	20.1	.1992	4.1
1.230	1.56447	186	1.85676	156	0.84258	20.0	1.1998	4.1
.231	.56633	186	.85833	157	.84287	20.0	.1994	4.1
.232	.56819	186	.85989	157	.84316	20.0	.1990	4.1
.233	.57005	186	.86146	157	.84345	20.0	.1996	4.1
.234	.57191	186	.86303	157	.84374	20.8	.1992	4.1
1.235	1.57377	186	1.86461	157	0.84403	20.8	1.1998	4.0
.236	.57564	187	.86618	158	.84431	20.7	.1994	4.0
.237	.57750	187	.86776	158	.84460	20.7	.1990	4.0
.238	.57937	187	.86934	158	.84488	20.6	.1996	4.0
.239	.58124	187	.87093	158	.84517	20.6	.1992	4.0
1.240	1.58311	187	1.87250	158	0.84546	20.5	1.1998	4.0
.241	.58499	187	.87408	158	.84574	20.5	.1994	4.0
.242	.58686	188	.87567	159	.84603	20.4	.1990	4.0
.243	.58874	188	.87726	159	.84631	20.4	.1996	4.0
.244	.59062	188	.87885	159	.84660	20.3	.1992	4.0
1.245	1.59250	188	1.88044	159	0.84688	20.3	1.1998	3.9
.246	.59438	188	.88203	159	.84716	20.2	.1994	3.9
.247	.59626	188	.88363	160	.84744	20.2	.1990	3.9
.248	.59815	189	.88522	160	.84773	20.1	.1996	3.9
.249	.60003	189	.88682	160	.84800	20.1	.1992	3.9
1.250	1.60192	189	1.88842	160	0.84828	20.0	1.1998	3.9
u	tanh u	= F'	coth u	= F'	sinh u	= F'	cosh u	= F'

Natural Hyperbolic Functions.

u	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$	$\tanh u$	$= F_3'$	$\coth u$	$= F_4'$
1.250	1.60192	189	1.88842	160	0.84828	28.0	1.1780	3.0
.251	.60281	189	.89005	160	.84856	28.0	.1785	3.0
.252	.60370	189	.89165	161	.84884	27.0	.1781	3.0
.253	.60459	189	.89324	161	.84912	27.0	.1777	3.0
.254	.60549	189	.89485	161	.84940	27.0	.1773	3.0
1.255	1.61138	190	1.89546	161	0.84968	27.8	1.1760	3.0
.256	.61228	190	.89607	161	.84996	27.8	.1765	3.8
.257	.61318	190	.89668	162	.85023	27.7	.1761	3.8
.258	.61408	190	.89730	162	.85051	27.7	.1758	3.8
.259	.61498	190	.89792	162	.85079	27.0	.1754	3.8
1.260	1.62088	190	1.90454	162	0.85106	27.6	1.1750	3.8
.261	.62179	191	.90516	162	.85134	27.5	.1746	3.8
.262	.62270	191	.90578	162	.85161	27.5	.1742	3.8
.263	.62361	191	.90641	163	.85189	27.4	.1739	3.8
.264	.62451	191	.90704	163	.85216	27.4	.1735	3.8
1.265	1.63043	191	1.91267	163	0.85244	27.3	1.1731	3.8
.266	.63134	191	.91330	163	.85271	27.3	.1727	3.8
.267	.63225	192	.91393	163	.85298	27.2	.1724	3.7
.268	.63316	192	.91457	164	.85325	27.2	.1720	3.7
.269	.63407	192	.91520	164	.85353	27.1	.1716	3.7
1.270	1.64001	192	1.92084	164	0.85380	27.1	1.1712	3.7
.271	.64113	192	.92248	164	.85407	27.1	.1709	3.7
.272	.64205	192	.92311	164	.85434	27.0	.1705	3.7
.273	.64298	193	.92375	165	.85461	27.0	.1701	3.7
.274	.64391	193	.92438	165	.85488	26.9	.1698	3.7
1.275	1.64964	193	1.92907	165	0.85515	26.9	1.1694	3.7
.276	.65057	193	.93072	165	.85542	26.8	.1690	3.7
.277	.65150	193	.93137	165	.85569	26.8	.1687	3.7
.278	.65243	193	.93202	166	.85595	26.7	.1683	3.6
.279	.65336	194	.93268	166	.85622	26.7	.1679	3.6
1.280	1.65930	194	1.93734	166	0.85648	26.6	1.1676	3.6
.281	.66124	194	.93800	166	.85675	26.6	.1672	3.6
.282	.66218	191	.93866	166	.85702	26.6	.1668	3.6
.283	.66312	194	.93933	167	.85728	26.5	.1665	3.6
.284	.66406	194	.93999	167	.85755	26.5	.1661	3.6
1.285	1.66501	195	1.94466	167	0.85781	26.4	1.1658	3.6
.286	.66696	195	.94533	167	.85808	26.4	.1654	3.6
.287	.66790	195	.94600	167	.85834	26.3	.1650	3.6
.288	.66885	195	.94668	167	.85860	26.3	.1647	3.6
.289	.66980	195	.94735	168	.85886	26.2	.1643	3.6
1.290	1.67576	195	1.95403	168	0.85913	26.2	1.1640	3.5
.291	.68071	196	.95371	168	.85939	26.1	.1636	3.5
.292	.68167	196	.95439	168	.85965	26.1	.1633	3.5
.293	.68263	196	.95507	168	.85991	26.1	.1630	3.5
.294	.68359	196	.95576	169	.86017	26.0	.1626	3.5
1.295	1.68855	196	1.96245	169	0.86043	26.0	1.1622	3.5
.296	.69051	196	.96314	169	.86069	25.9	.1619	3.5
.297	.69148	197	.96383	169	.86095	25.9	.1615	3.5
.298	.69244	197	.96452	169	.86121	25.8	.1612	3.5
.299	.69341	197	.96522	170	.86147	25.8	.1608	3.5
1.300	1.69838	197	1.97091	170	0.86172	25.7	1.1605	3.5
u	$\tanh u$	$= F_1'$	$\coth u$	$= F_2'$	$\sinh u$	$= F_3'$	$\cosh u$	$= F_4'$

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
1.300	1.69836	107	1.69709	170	0.86172	25.7	1.1605	3.5
.301	.70033	107	.69916	170	.86168	25.7	.1601	3.5
.302	.70231	107	.69743	170	.86224	25.7	.1598	3.5
.303	.70430	108	.69602	170	.86249	25.6	.1594	3.4
.304	.70628	108	.69772	171	.86275	25.6	.1591	3.4
1.305	1.70826	108	1.69703	171	0.86300	25.5	1.1587	3.4
.306	.71024	108	.69814	171	.86326	25.5	.1584	3.4
.307	.71222	108	.69885	171	.86351	25.4	.1581	3.4
.308	.71420	108	.69956	171	.86377	25.4	.1577	3.4
.309	.71619	109	.69828	172	.86402	25.3	.1574	3.4
1.310	1.71818	109	1.69800	172	0.86428	25.3	1.1570	3.4
.311	.72017	109	.69872	172	.86453	25.3	.1567	3.4
.312	.72216	109	.69944	172	.86478	25.2	.1564	3.4
.313	.72415	109	.69916	172	.86503	25.2	.1560	3.4
.314	.72614	109	.69989	173	.86528	25.1	.1557	3.4
1.315	1.72814	200	1.69961	173	0.86554	25.1	1.1554	3.3
.316	.73014	200	.69934	173	.86579	25.0	.1550	3.3
.317	.73214	200	2.00007	173	.86604	25.0	.1547	3.3
.318	.73414	200	.00181	173	.86629	25.0	.1544	3.3
.319	.73614	200	.00354	174	.86653	24.0	.1540	3.3
1.320	1.73814	201	2.00328	174	0.86678	24.0	1.1537	3.3
.321	.74015	201	.00702	174	.86703	24.8	.1534	3.3
.322	.74216	201	.00876	174	.86728	24.8	.1530	3.3
.323	.74417	201	.01050	174	.86753	24.7	.1527	3.3
.324	.74618	201	.01225	175	.86778	24.7	.1524	3.3
1.325	1.74819	201	2.01300	175	0.86802	24.7	1.1520	3.3
.326	.75021	202	.01574	175	.86827	24.6	.1517	3.3
.327	.75222	202	.01749	175	.86851	24.6	.1514	3.3
.328	.75424	202	.01925	175	.86876	24.5	.1511	3.3
.329	.75626	202	.02100	176	.86900	24.5	.1507	3.3
1.330	1.75828	202	2.02276	176	0.86925	24.4	1.1504	3.2
.331	.76031	202	.02452	176	.86949	24.4	.1501	3.2
.332	.76233	203	.02628	176	.86974	24.4	.1498	3.2
.333	.76436	203	.02804	176	.86998	24.3	.1495	3.2
.334	.76639	203	.02981	177	.87022	24.3	.1491	3.2
1.335	1.76842	203	2.03158	177	0.87047	24.2	1.1488	3.2
.336	.77045	203	.03335	177	.87071	24.2	.1485	3.2
.337	.77248	204	.03512	177	.87095	24.1	.1482	3.2
.338	.77452	204	.03689	177	.87119	24.1	.1479	3.2
.339	.77656	204	.03867	178	.87143	24.1	.1475	3.2
1.340	1.77859	204	2.04044	178	0.87167	24.0	1.1472	3.2
.341	.78064	204	.04222	178	.87191	24.0	.1469	3.2
.342	.78268	204	.04401	178	.87215	24.0	.1466	3.1
.343	.78473	205	.04579	178	.87239	24.0	.1463	3.1
.344	.78677	205	.04758	179	.87263	24.0	.1460	3.1
1.345	1.78882	205	2.04936	179	0.87287	24.8	1.1456	3.1
.346	.79087	205	.05115	179	.87311	24.8	.1453	3.1
.347	.79293	205	.05294	179	.87334	24.7	.1450	3.1
.348	.79498	205	.05474	179	.87358	24.7	.1447	3.1
.349	.79704	206	.05653	180	.87382	24.6	.1444	3.1
1.350	1.79909	206	2.05833	180	0.87405	24.6	1.1441	3.1
u	tan pd u	= F ₁ '	sec pd u	= F ₂ '	sin pd u	= F ₃ '	cos pd u	= F ₄ '

BRITISH STANDARD TABLES

Natural Hyperbolic Functions.

u	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$	$\tanh u$	$= F_3'$	$\coth u$	$= F_4'$
1.350	1.70000	200	2.059813	180	0.825105	210	1.2111	3.1
.351	.80115	200	.00013	180	.825130	210	.1418	3.1
.352	.80131	200	.00014	180	.825152	210	.1435	3.1
.353	.80148	200	.00015	180	.825176	210	.1452	3.1
.354	.80164	200	.00015	180	.825199	210	.1469	3.1
1.355	1.80211	200	2.059735	180	0.82523	210	1.2426	3.1
.356	.80178	200	.00016	180	.825240	210	.1483	3.0
.357	.80193	200	.00016	180	.825260	210	.1499	3.0
.358	.80208	200	.00017	180	.825283	210	.1516	3.0
.359	.80224	200	.00017	180	.825300	210	.1533	3.0
1.360	1.80277	200	2.059643	180	0.825319	210	1.2410	3.0
.361	.80184	200	.00015	180	.825302	210	.1507	3.0
.362	.80194	200	.00016	180	.825306	210	.1504	3.0
.363	.80200	200	.00016	180	.825309	210	.1501	3.0
.364	.80209	200	.00015	180	.825312	210	.1508	3.0
1.365	1.80317	200	2.059555	180	0.825335	210	1.2395	3.0
.366	.80225	200	.00015	180	.825328	210	.1502	3.0
.367	.80235	200	.00015	180	.825331	210	.1500	3.0
.368	.80241	200	.00015	180	.825334	210	.1500	3.0
.369	.80248	200	.00015	180	.825336	210	.1501	3.0
1.370	1.80362	200	2.059473	180	0.825360	210	1.2381	3.0
.371	.80254	200	.00015	180	.825352	210	.1500	2.9
.372	.80264	200	.00015	180	.825355	210	.1500	2.9
.373	.80270	200	.00015	180	.825357	210	.1500	2.9
.374	.80278	200	.00015	180	.825360	210	.1500	2.9
1.375	1.80412	200	2.059390	180	0.825383	210	1.2365	2.9
.376	.80282	211	.00015	180	.825366	210	.1501	2.9
.377	.80293	211	.00016	180	.825368	210	.1500	2.9
.378	.80299	211	.00015	180	.825369	210	.1500	2.9
.379	.80305	211	.00015	180	.825373	210	.1501	2.9
1.380	1.80460	211	2.059311	180	0.825395	210	1.2351	2.9
.381	.80315	212	.00015	180	.825377	210	.1501	2.9
.382	.80326	212	.00016	180	.825379	210	.1500	2.9
.383	.80332	212	.00015	180	.825380	210	.1501	2.9
.384	.80339	212	.00015	180	.825381	210	.1500	2.9
1.385	1.80478	212	2.059237	180	0.825409	210	1.2337	2.9
.386	.80347	212	.00015	180	.825392	210	.1501	2.8
.387	.80350	213	.00015	180	.825395	210	.1501	2.8
.388	.80355	213	.00015	180	.825397	210	.1500	2.8
.389	.80360	213	.00015	180	.825398	210	.1500	2.8
1.390	1.80520	213	2.059160	180	0.825417	210	1.2323	2.8
.391	.80369	213	.00015	180	.825400	210	.1500	2.8
.392	.80376	214	.00015	180	.825401	210	.1500	2.8
.393	.80380	214	.00015	180	.825403	210	.1500	2.8
.394	.80384	214	.00015	180	.825405	210	.1500	2.8
1.395	1.80557	214	2.059100	180	0.825427	210	1.2309	2.8
.396	.80397	214	.00015	180	.825408	210	.1500	2.8
.397	.80400	215	.00015	180	.825409	210	.1500	2.8
.398	.80405	215	.00015	180	.825412	210	.1500	2.8
.399	.80410	215	.00015	180	.825413	210	.1500	2.8
1.400	1.80430	215	2.059060	180	0.825435	210	1.2295	2.8
u	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$	$\tanh u$	$= F_3'$	$\coth u$	$= F_4'$

Natural Hyperbolic Functions.

u	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$	$\sinh^{-1} u$	$\cosh^{-1} u$
1.400	1.00430	2.15	0.88535	21.6	1.1895	2.8
.401	.00445	2.15	.88557	21.6	.1897	2.8
.402	.00861	2.15	.88578	21.5	.1899	2.7
.403	.01276	2.16	.88600	21.5	.1897	2.7
.404	.01691	2.16	.88621	21.5	.1894	2.7
1.405	1.01508	2.16	0.88643	21.4	1.1881	2.7
.406	.01724	2.16	.88664	21.4	.1879	2.7
.407	.01940	2.16	.88686	21.3	.1879	2.7
.408	.02157	2.17	.88707	21.3	.1873	2.7
.409	.02374	2.17	.88728	21.3	.1870	2.7
1.410	1.02391	2.17	0.88740	21.2	1.1868	2.7
.411	.02608	2.17	.88771	21.2	.1868	2.7
.412	.02825	2.17	.88792	21.2	.1862	2.7
.413	.03042	2.18	.88813	21.1	.1860	2.7
.414	.03260	2.18	.88834	21.1	.1857	2.7
1.415	1.03098	2.18	0.88855	21.0	1.1854	2.7
.416	.03396	2.18	.88876	21.0	.1852	2.7
.417	.03614	2.18	.88897	21.0	.1849	2.7
.418	.03833	2.19	.88918	20.9	.1849	2.6
.419	.04051	2.19	.88939	20.9	.1844	2.6
1.420	1.04190	2.19	0.88960	20.9	1.1841	2.6
.421	.04409	2.19	.88981	20.8	.1838	2.6
.422	.04628	2.19	.89002	20.8	.1835	2.6
.423	.04846	2.20	.89023	20.8	.1833	2.6
.424	.05065	2.20	.89043	20.7	.1831	2.6
1.425	1.05367	2.20	0.89064	20.7	1.1828	2.6
.426	.05287	2.20	.89084	20.6	.1825	2.6
.427	.05506	2.20	.89105	20.6	.1823	2.6
.428	.05725	2.21	.89125	20.6	.1820	2.6
.429	.05944	2.21	.89145	20.5	.1818	2.6
1.430	1.06090	2.21	0.89167	20.5	1.1815	2.6
.431	.06191	2.21	.89187	20.5	.1812	2.6
.432	.06412	2.21	.89208	20.4	.1810	2.6
.433	.06633	2.21	.89228	20.4	.1807	2.6
.434	.06855	2.22	.89248	20.3	.1805	2.6
1.435	1.06806	2.22	0.89269	20.3	1.1802	2.5
.436	.07028	2.22	.89289	20.3	.1800	2.5
.437	.07250	2.22	.89309	20.2	.1797	2.5
.438	.07471	2.22	.89329	20.2	.1795	2.5
.439	.07693	2.23	.89350	20.2	.1792	2.5
1.440	1.07188	2.23	0.89370	20.1	1.1789	2.5
.441	.07911	2.23	.89390	20.1	.1787	2.5
.442	.08133	2.23	.89410	20.1	.1784	2.5
.443	.08355	2.23	.89430	20.0	.1782	2.5
.444	.08578	2.24	.89450	20.0	.1779	2.5
1.445	1.08095	2.24	0.89470	20.0	1.1777	2.5
.446	.08819	2.24	.89490	19.9	.1774	2.5
.447	.09041	2.24	.89510	19.9	.1772	2.5
.448	.09263	2.24	.89530	19.8	.1769	2.5
.449	.09486	2.25	.89550	19.8	.1767	2.5
1.450	1.08447	2.25	0.89569	19.8	1.1765	2.5
u	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$	$\sinh^{-1} u$	$\cosh^{-1} u$

Natural Hyperbolic Functions.

u	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$	$\tanh u$	$= F_3'$	$\coth u$	$= F_4'$
1.190	.501477	.225	1.24881	.301	0.39959	0.8	1.1005	.25
.191	.501952	.225	1.25086	.302	.39979	0.7	1.0912	.25
.192	.502427	.225	1.25291	.302	.39999	0.6	1.0819	.25
.193	.502902	.225	1.25496	.302	.39988	0.5	1.0727	.25
.194	.503378	.226	1.25701	.302	.39998	0.4	1.0635	.25
1.195	.503854	.226	1.25906	.303	0.39968	0.3	1.0542	.25
.196	.504329	.226	1.26112	.303	.39987	0.2	1.0450	.25
.197	.504805	.226	1.26317	.303	.39997	0.1	1.0357	.25
.198	.505280	.227	1.26523	.303	.39976	0.0	1.0265	.25
.199	.505756	.227	1.26728	.303	.39996	0.0	1.0173	.25
1.200	.506231	.227	1.26934	.304	0.39965	0.0	1.0080	.25
1.201	.506707	.227	1.27139	.304	.39985	0.0	1.0088	.25
.202	.507182	.227	1.27345	.304	.39995	0.0	1.0096	.25
.203	.507658	.228	1.27550	.304	.39984	0.0	1.0104	.25
.204	.508133	.228	1.27756	.305	.39994	0.0	1.0112	.25
1.205	.508609	.228	1.27961	.305	0.39963	0.0	1.0120	.25
.206	.509084	.228	1.28167	.305	.39983	0.0	1.0128	.25
.207	.509560	.228	1.28372	.305	.39993	0.0	1.0136	.25
.208	.510035	.229	1.28578	.306	.39982	0.0	1.0144	.25
.209	.510511	.229	1.28783	.306	.39992	0.0	1.0152	.25
1.210	.510986	.229	1.28989	.306	0.39961	0.0	1.0160	.25
.211	.511462	.229	1.29194	.306	.39981	0.0	1.0168	.25
.212	.511937	.229	1.29400	.306	.39991	0.0	1.0176	.25
.213	.512413	.230	1.29605	.306	.39980	0.0	1.0184	.25
.214	.512888	.230	1.29811	.307	.39990	0.0	1.0192	.25
1.215	.513364	.230	1.29994	.307	0.39959	0.0	1.0200	.25
.216	.513839	.230	1.30200	.307	.39979	0.0	1.0208	.25
.217	.514315	.230	1.30405	.307	.39989	0.0	1.0216	.25
.218	.514790	.231	1.30611	.307	.39999	0.0	1.0224	.25
.219	.515266	.231	1.30816	.307	.39988	0.0	1.0232	.25
1.220	.515741	.231	1.31022	.308	0.39957	0.0	1.0240	.25
.221	.516217	.231	1.31227	.308	.39977	0.0	1.0248	.25
.222	.516692	.231	1.31433	.308	.39987	0.0	1.0256	.25
.223	.517168	.231	1.31638	.308	.39997	0.0	1.0264	.25
.224	.517643	.232	1.31844	.309	.39986	0.0	1.0272	.25
.225	.518119	.232	1.32049	.309	.39996	0.0	1.0280	.25
1.226	.518594	.232	1.32255	.309	0.39965	0.0	1.0288	.25
.227	.519070	.232	1.32460	.309	.39985	0.0	1.0296	.25
.228	.519545	.232	1.32666	.309	.39995	0.0	1.0304	.25
.229	.520021	.233	1.32871	.309	.39984	0.0	1.0312	.25
.230	.520496	.233	1.33077	.310	.39994	0.0	1.0320	.25
1.231	.520972	.233	1.33282	.310	0.39963	0.0	1.0328	.25
.232	.521447	.233	1.33488	.310	.39983	0.0	1.0336	.25
.233	.521923	.233	1.33693	.310	.39993	0.0	1.0344	.25
.234	.522398	.234	1.33899	.311	.39982	0.0	1.0352	.25
.235	.522874	.234	1.34104	.311	.39992	0.0	1.0360	.25
1.236	.523349	.234	1.34310	.311	0.39961	0.0	1.0368	.25
.237	.523825	.234	1.34515	.311	.39981	0.0	1.0376	.25
.238	.524300	.234	1.34721	.311	.39991	0.0	1.0384	.25
.239	.524776	.235	1.34926	.312	.39980	0.0	1.0392	.25
1.240	.525251	.235	1.35132	.312	.39990	0.0	1.0400	.25
.241	.525727	.235	1.35337	.312	.39989	0.0	1.0408	.25
.242	.526202	.235	1.35543	.312	.39999	0.0	1.0416	.25
.243	.526678	.236	1.35748	.313	.39988	0.0	1.0424	.25
1.244	.527153	.236	1.35954	.313	0.39957	0.0	1.0432	.25
.245	.527629	.236	1.36159	.313	.39977	0.0	1.0440	.25
.246	.528104	.236	1.36365	.313	.39987	0.0	1.0448	.25
.247	.528580	.237	1.36570	.313	.39997	0.0	1.0456	.25
.248	.529055	.237	1.36776	.314	.39986	0.0	1.0464	.25
.249	.529531	.237	1.36981	.314	.39996	0.0	1.0472	.25
1.250	.530006	.237	1.37187	.314	0.39965	0.0	1.0480	.25
2	3.14238	.235	1.38441	.314	0.39955	0.0	1.0488	.25
u	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$	$\tanh u$	$= F_3'$	$\coth u$	$= F_4'$

Natural Hyperbolic Functions.

u	$\sinh u$	$= F'_u$	$\cosh u$	$= F_u$	$\tanh u$	$= F'_u$	$\coth u$	$= F_u$
1.500	2.12928	2.35	2.35441	2.13	0.90515	18.1	1.10488	4.2
.501	1.5163	2.35	1.51541	2.13	.90513	18.0	1.1049	4.2
.502	1.5300	2.36	1.5306	2.13	.90511	18.0	1.1041	4.2
.503	1.5435	2.36	1.54381	2.13	.90509	18.0	1.1041	4.2
.504	1.5571	2.36	1.55805	2.13	.90507	17.9	1.1039	4.2
1.505	2.14307	2.36	2.36099	2.13	0.90505	17.9	1.1032	4.2
.506	1.5633	2.37	1.56543	2.13	.90503	17.9	1.1035	4.2
.507	1.5780	2.37	1.57747	2.15	.90501	17.8	1.1033	4.2
.508	1.5917	2.37	1.59352	2.15	.90500	17.8	1.1030	4.2
.509	1.6054	2.37	1.60747	2.15	.90498	17.8	1.1028	4.2
1.510	2.15291	2.37	2.37382	2.15	0.90496	17.7	1.1020	4.2
.511	1.62412	2.38	1.62502	2.16	.90494	17.7	1.1021	4.2
.512	1.6375	2.38	1.63813	2.16	.90492	17.7	1.1022	4.2
.513	1.65004	2.38	1.65029	2.16	.90490	17.6	1.1020	4.1
.514	1.66242	2.38	1.66215	2.16	.90488	17.6	1.1018	4.1
1.515	2.16381	2.38	2.38591	2.16	0.90486	17.5	1.1015	4.1
.516	1.67910	2.39	1.68097	2.17	.90484	17.5	1.1013	4.1
.517	1.69335	2.39	1.69305	2.17	.90482	17.5	1.1011	4.1
.518	1.70750	2.39	1.70712	2.17	.90480	17.5	1.1009	4.1
.519	1.72135	2.39	1.72115	2.17	.90478	17.5	1.1007	4.1
1.520	2.17066	2.40	2.39547	2.18	0.90476	17.4	1.1005	4.1
.521	1.73915	2.40	1.73915	2.18	.90474	17.4	1.1003	4.1
.522	1.7535	2.40	1.75383	2.18	.90472	17.4	1.1001	4.1
.523	1.76795	2.40	1.76821	2.18	.90470	17.3	1.0998	4.1
.524	1.78230	2.40	1.78219	2.19	.90468	17.3	1.0996	4.1
1.525	2.18896	2.41	2.40598	2.19	0.90466	17.3	1.0994	4.1
.526	1.79917	2.41	1.80057	2.19	.90464	17.2	1.0992	4.1
.527	1.80958	2.41	1.81097	2.19	.90462	17.2	1.0990	4.1
.528	1.82000	2.41	1.82136	2.20	.90460	17.2	1.0988	4.1
.529	1.83040	2.42	1.83170	2.20	.90458	17.1	1.0986	4.1
1.530	2.20082	2.42	2.41776	2.20	0.90456	17.1	1.0984	4.1
.531	1.84021	2.42	1.84095	2.20	.90454	17.1	1.0982	4.1
.532	1.85060	2.42	1.85176	2.20	.90452	17.1	1.0980	4.1
.533	1.86098	2.42	1.86207	2.21	.90450	17.0	1.0978	4.1
.534	1.87151	2.43	1.87281	2.21	.90448	17.0	1.0976	4.0
1.535	2.21293	2.43	2.42839	2.21	0.90446	17.0	1.0974	4.0
.536	1.88230	2.43	1.88304	2.21	.90444	16.9	1.0972	4.0
.537	1.89270	2.43	1.89382	2.22	.90442	16.9	1.0970	4.0
.538	1.90313	2.43	1.90481	2.22	.90440	16.9	1.0968	4.0
.539	1.91357	2.44	1.91570	2.22	.90438	16.8	1.0965	4.0
1.540	2.22510	2.44	2.43910	2.23	0.90436	16.8	1.0963	4.0
.541	1.92755	2.44	1.92771	2.23	.90434	16.8	1.0961	4.0
.542	1.93800	2.44	1.93804	2.23	.90432	16.7	1.0959	4.0
.543	1.94843	2.45	1.94847	2.23	.90430	16.7	1.0957	4.0
.544	1.95888	2.45	1.95891	2.23	.90428	16.7	1.0955	4.0
1.545	2.23733	2.45	2.45061	2.23	0.90426	16.7	1.0953	4.0
.546	1.96928	2.45	1.96928	2.24	.90424	16.6	1.0951	4.0
.547	1.97972	2.45	1.97972	2.24	.90422	16.6	1.0949	4.0
.548	1.99016	2.45	1.99016	2.24	.90420	16.6	1.0947	4.0
.549	2.00061	2.45	2.00061	2.25	.90418	16.5	1.0945	4.0
1.550	2.24961	2.46	2.46186	2.25	0.90416	16.5	1.0943	4.0
u	$\sinh u$	$= F'_u$	$\cosh u$	$= F_u$	$\tanh u$	$= F'_u$	$\coth u$	$= F_u$

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Natural Hyperbolic Functions.

x	$\sinh x$	$= F_1'$	$\cosh x$	$= F_2'$	$\sinh x$	$= F_1'$	$\cosh x$	$= F_2'$
1.550	2.22931	2.16	2.56186	2.25	0.91370	10.5	1.0943	2.0
.551	.25207	2.16	.64111	2.25	.91395	10.5	.0942	2.0
.552	.25454	2.17	.64366	2.25	.91411	10.6	.0940	2.0
.553	.25701	2.17	.64621	2.26	.91428	10.6	.0938	2.0
.554	.25948	2.17	.64876	2.26	.91444	10.6	.0936	2.0
1.555	2.26195	2.17	2.57441	2.26	0.91461	10.6	1.0934	2.0
.556	.26442	2.18	.65121	2.26	.91477	10.6	.0932	2.0
.557	.26689	2.18	.65376	2.27	.91493	10.6	.0930	1.9
.558	.26936	2.18	.65631	2.27	.91510	10.6	.0928	1.9
.559	.27183	2.18	.65886	2.27	.91526	10.6	.0926	1.9
1.560	2.27441	2.18	2.58196	2.27	0.91542	10.6	1.0924	1.9
.561	.27688	2.19	.66151	2.28	.91558	10.6	.0922	1.9
.562	.27935	2.19	.66406	2.28	.91574	10.6	.0920	1.9
.563	.28182	2.19	.66661	2.28	.91591	10.6	.0918	1.9
.564	.28429	2.19	.66916	2.28	.91607	10.6	.0916	1.9
1.565	2.28699	2.19	2.58888	2.29	0.91623	10.6	1.0914	1.9
.566	.28646	2.19	.67172	2.29	.91639	10.6	.0912	1.9
.567	.28893	2.19	.67427	2.29	.91655	10.6	.0911	1.9
.568	.29140	2.19	.67682	2.29	.91671	10.6	.0909	1.9
.569	.29387	2.20	.67937	2.29	.91687	10.6	.0907	1.9
1.570	2.29930	2.20	2.59735	2.29	0.91703	10.6	1.0905	1.9
.571	.29681	2.20	.68191	2.29	.91719	10.6	.0903	1.9
.572	.29928	2.20	.68446	2.30	.91734	10.6	.0901	1.9
.573	.30175	2.20	.68701	2.30	.91750	10.6	.0899	1.9
.574	.30422	2.20	.68956	2.30	.91766	10.6	.0897	1.9
1.575	2.31187	2.20	2.59887	2.30	0.91782	10.6	1.0895	1.9
.576	.31430	2.20	.69141	2.30	.91797	10.6	.0893	1.9
.577	.31677	2.20	.69396	2.30	.91813	10.6	.0891	1.9
.578	.31924	2.20	.69651	2.30	.91829	10.6	.0889	1.9
.579	.32166	2.20	.69906	2.30	.91845	10.6	.0888	1.9
1.580	2.32449	2.20	2.59947	2.30	0.91860	10.6	1.0886	1.9
.581	.32692	2.20	.69951	2.30	.91876	10.6	.0884	1.9
.582	.32939	2.20	.70206	2.30	.91891	10.6	.0882	1.9
.583	.33186	2.20	.70461	2.30	.91907	10.6	.0880	1.9
.584	.33433	2.20	.70716	2.30	.91922	10.6	.0879	1.9
1.585	2.33717	2.20	2.59947	2.30	0.91938	10.6	1.0877	1.9
.586	.33664	2.20	.70971	2.30	.91953	10.6	.0875	1.9
.587	.33911	2.20	.71226	2.30	.91969	10.6	.0873	1.9
.588	.34158	2.20	.71481	2.30	.91984	10.6	.0871	1.9
.589	.34405	2.20	.71736	2.30	.91999	10.6	.0870	1.9
1.590	2.34991	2.20	2.59947	2.30	0.92015	10.6	1.0868	1.9
.591	.34742	2.20	.72091	2.30	.92030	10.6	.0866	1.9
.592	.34989	2.20	.72346	2.30	.92046	10.6	.0864	1.9
.593	.35236	2.20	.72601	2.30	.92061	10.6	.0862	1.9
.594	.35483	2.20	.72856	2.30	.92076	10.6	.0860	1.9
1.595	2.36271	2.20	2.59947	2.30	0.92091	10.6	1.0860	1.9
.596	.35728	2.20	.73111	2.30	.92106	10.6	.0857	1.9
.597	.35975	2.20	.73366	2.30	.92122	10.6	.0855	1.9
.598	.36222	2.20	.73621	2.30	.92137	10.6	.0853	1.9
.599	.36469	2.20	.73876	2.30	.92152	10.6	.0852	1.9
1.600	2.37357	2.20	2.59947	2.30	0.92167	10.6	1.0850	1.9
u	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
1.000	2.37557	258	2.57946	238	0.92169	15.7	1.0850	1.8
.001	.37815	258	.57984	238	.92182	15.9	.0858	1.8
.002	.75631	258	.58222	238	.92197	15.9	.0866	1.8
.003	1.13447	258	.58460	238	.92212	15.9	.0875	1.8
.004	1.51263	259	.58699	239	.92227	14.9	.0883	1.8
1.005	2.38849	259	2.58137	239	0.92242	14.9	1.0881	1.8
.006	.39108	259	.58176	239	.92257	14.9	.0890	1.7
.007	.78216	259	.58416	239	.92272	14.9	.0898	1.7
.008	1.17324	259	.58655	239	.92286	14.8	.0906	1.7
.009	1.56432	260	.58895	240	.92301	14.8	.0914	1.7
1.010	2.40146	260	2.60135	240	0.92316	14.8	1.0912	1.7
.011	.40405	260	.60375	240	.92331	14.8	.0921	1.7
.012	.80810	261	.60616	241	.92346	14.7	.0929	1.7
.013	1.21215	261	.60857	241	.92360	14.7	.0937	1.7
.014	1.61620	261	.61098	241	.92375	14.7	.0945	1.7
1.015	2.41458	261	2.61139	241	0.92390	14.6	1.0944	1.7
.016	.41717	262	.61581	242	.92404	14.6	.0952	1.7
.017	.83434	262	.61822	242	.92419	14.6	.0960	1.7
.018	1.25151	262	.62064	242	.92433	14.6	.0969	1.7
.019	1.66868	262	.62307	242	.92448	14.5	.0977	1.7
1.020	2.42769	263	2.62549	243	0.92462	14.5	1.0985	1.7
.021	.43022	263	.62792	243	.92477	14.5	.0994	1.7
.022	.86044	263	.63035	243	.92491	14.5	.1002	1.7
.023	1.29066	263	.63279	244	.92506	14.4	.1010	1.7
.024	1.72088	264	.63522	244	.92520	14.4	.1018	1.7
1.025	2.44075	264	2.63769	244	0.92535	14.4	1.0997	1.7
.026	.44330	264	.64011	244	.92549	14.3	.1005	1.7
.027	.88660	264	.64255	245	.92563	14.3	.1013	1.7
.028	1.33000	264	.64500	245	.92578	14.3	.1021	1.7
.029	1.77340	265	.64745	245	.92592	14.3	.1029	1.7
1.030	2.45397	265	2.64990	245	0.92606	14.2	1.0998	1.7
.031	.45652	265	.65236	246	.92620	14.2	.1037	1.7
.032	.91304	265	.65482	246	.92635	14.2	.1045	1.7
.033	1.36956	266	.65728	246	.92649	14.2	.1053	1.6
.034	1.82608	266	.65974	246	.92663	14.1	.1061	1.6
1.035	2.46725	266	2.66221	247	0.92677	14.1	1.0999	1.6
.036	.46982	266	.66467	247	.92691	14.1	.1069	1.6
.037	.93964	267	.66715	247	.92705	14.1	.1077	1.6
.038	1.40946	267	.66962	248	.92719	14.0	.1085	1.6
.039	1.87928	267	.67210	248	.92733	14.0	.1093	1.6
1.040	2.48059	267	2.67457	248	0.92747	14.0	1.0999	1.6
.041	.48317	268	.67706	248	.92761	14.0	.1101	1.6
.042	.96634	268	.67954	249	.92775	13.9	.1109	1.6
.043	1.44951	268	.68203	249	.92789	13.9	.1117	1.6
.044	1.93268	268	.68452	249	.92803	13.9	.1125	1.6
1.045	2.49400	269	2.68701	249	0.92817	13.9	1.0999	1.6
.046	.49659	269	.68951	250	.92831	13.8	.1133	1.6
.047	.99318	269	.69200	250	.92845	13.8	.1141	1.6
.048	1.48977	269	.69449	250	.92859	13.8	.1149	1.6
.049	1.98636	270	.69698	250	.92873	13.7	.1157	1.6
1.050	2.50746	270	2.69951	251	0.92886	13.7	1.0999	1.6
u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '

SMITHSONIAN TABLES

Natural Hyperbolic Functions.

x	$\sinh x$	$\cosh x$	$\tanh x$	$\coth x$	$\sinh x$	$\cosh x$	$\tanh x$	$\coth x$
1.690	2.50740	270	2.69051	251	0.00888	13.7	1.0766	1.6
1.691	2.51017	270	2.69312	251	0.00889	13.7	1.0764	1.6
1.692	2.51297	270	2.69574	251	0.00891	13.7	1.0763	1.6
1.693	2.51577	271	2.69835	252	0.00892	13.6	1.0761	1.6
1.694	2.51858	271	2.70097	252	0.00894	13.6	1.0760	1.6
1.695	2.52139	271	2.71359	252	0.00895	13.6	1.0758	1.6
1.696	2.52421	271	2.71621	252	0.00896	13.6	1.0756	1.6
1.697	2.52704	272	2.71883	253	0.00898	13.5	1.0755	1.6
1.698	2.52987	272	2.72145	253	0.00899	13.5	1.0753	1.6
1.699	2.53270	272	2.72407	253	0.00900	13.5	1.0752	1.6
1.700	2.53553	272	2.72669	253	0.00901	13.5	1.0750	1.6
1.701	2.53836	273	2.72931	254	0.00902	13.4	1.0749	1.6
1.702	2.54119	273	2.73193	254	0.00903	13.4	1.0747	1.6
1.703	2.54402	273	2.73455	254	0.00904	13.4	1.0746	1.6
1.704	2.54685	273	2.73717	255	0.00905	13.4	1.0744	1.6
1.705	2.54968	274	2.73979	255	0.00906	13.3	1.0742	1.6
1.706	2.55251	274	2.74241	255	0.00907	13.3	1.0741	1.6
1.707	2.55534	274	2.74503	255	0.00908	13.3	1.0739	1.6
1.708	2.55817	275	2.74765	256	0.00909	13.3	1.0738	1.6
1.709	2.56100	275	2.75027	256	0.00910	13.2	1.0736	1.6
1.710	2.56383	275	2.75289	256	0.00911	13.2	1.0735	1.6
1.711	2.56666	275	2.75551	257	0.00912	13.2	1.0733	1.6
1.712	2.56949	276	2.75813	257	0.00913	13.2	1.0732	1.6
1.713	2.57232	276	2.76075	257	0.00914	13.1	1.0730	1.6
1.714	2.57515	276	2.76337	257	0.00915	13.1	1.0729	1.6
1.715	2.57798	276	2.76599	258	0.00916	13.1	1.0727	1.6
1.716	2.58081	277	2.76861	258	0.00917	13.1	1.0726	1.6
1.717	2.58364	277	2.77123	258	0.00918	13.0	1.0724	1.6
1.718	2.58647	277	2.77385	258	0.00919	13.0	1.0723	1.6
1.719	2.58930	277	2.77647	259	0.00920	13.0	1.0721	1.6
1.720	2.59213	278	2.77909	259	0.00921	13.0	1.0720	1.6
1.721	2.59496	278	2.78171	259	0.00922	13.0	1.0718	1.6
1.722	2.59779	278	2.78433	260	0.00923	13.0	1.0717	1.6
1.723	2.60062	279	2.78695	260	0.00924	13.0	1.0715	1.6
1.724	2.60345	279	2.78957	260	0.00925	13.0	1.0714	1.6
1.725	2.60628	279	2.79219	260	0.00926	13.0	1.0712	1.6
1.726	2.60911	279	2.79481	261	0.00927	12.9	1.0711	1.6
1.727	2.61194	279	2.79743	261	0.00928	12.9	1.0709	1.6
1.728	2.61477	280	2.79999	261	0.00929	12.9	1.0708	1.6
1.729	2.61760	280	2.80261	261	0.00930	12.9	1.0706	1.6
1.730	2.62043	280	2.80523	262	0.00931	12.9	1.0705	1.6
1.731	2.62326	280	2.80785	262	0.00932	12.9	1.0703	1.6
1.732	2.62609	281	2.81047	262	0.00933	12.9	1.0702	1.6
1.733	2.62892	281	2.81309	263	0.00934	12.9	1.0701	1.6
1.734	2.63175	281	2.81571	263	0.00935	12.9	1.0699	1.6
1.735	2.63458	282	2.81833	263	0.00936	12.9	1.0698	1.6
1.736	2.63741	282	2.82095	263	0.00937	12.9	1.0696	1.6
1.737	2.64024	282	2.82357	264	0.00938	12.9	1.0695	1.6
1.738	2.64307	283	2.82619	264	0.00939	12.9	1.0693	1.6
1.739	2.64590	283	2.82881	264	0.00940	12.9	1.0692	1.6
1.740	2.64873	283	2.83143	265	0.00941	12.9	1.0691	1.6
1.741	2.65156	283	2.83405	265	0.00942	12.9	1.0690	1.6
1.742	2.65439	284	2.83667	265	0.00943	12.9	1.0688	1.6
1.743	2.65722	284	2.83929	265	0.00944	12.9	1.0687	1.6
1.744	2.66005	284	2.84191	266	0.00945	12.9	1.0685	1.6
1.745	2.66288	284	2.84453	266	0.00946	12.9	1.0684	1.6
1.746	2.66571	285	2.84715	266	0.00947	12.9	1.0682	1.6
1.747	2.66854	285	2.84977	266	0.00948	12.9	1.0681	1.6
1.748	2.67137	285	2.85239	267	0.00949	12.9	1.0679	1.6
1.749	2.67420	285	2.85501	267	0.00950	12.9	1.0678	1.6
1.750	2.67703	285	2.85763	267	0.00951	12.9	1.0676	1.6
1.751	2.67986	286	2.86025	267	0.00952	12.9	1.0675	1.6
1.752	2.68269	286	2.86287	267	0.00953	12.9	1.0673	1.6
1.753	2.68552	286	2.86549	268	0.00954	12.9	1.0672	1.6
1.754	2.68835	286	2.86811	268	0.00955	12.9	1.0670	1.6
1.755	2.69118	287	2.87073	268	0.00956	12.9	1.0669	1.6
1.756	2.69401	287	2.87335	268	0.00957	12.9	1.0667	1.6
1.757	2.69684	287	2.87597	268	0.00958	12.9	1.0666	1.6
1.758	2.69967	287	2.87859	269	0.00959	12.9	1.0664	1.6
1.759	2.70250	287	2.88121	269	0.00960	12.9	1.0663	1.6
1.760	2.70533	288	2.88383	269	0.00961	12.9	1.0661	1.6
1.761	2.70816	288	2.88645	269	0.00962	12.9	1.0660	1.6
1.762	2.71099	288	2.88907	270	0.00963	12.9	1.0658	1.6
1.763	2.71382	288	2.89169	270	0.00964	12.9	1.0657	1.6
1.764	2.71665	289	2.89431	270	0.00965	12.9	1.0655	1.6
1.765	2.71948	289	2.89693	270	0.00966	12.9	1.0654	1.6
1.766	2.72231	289	2.89955	271	0.00967	12.9	1.0652	1.6
1.767	2.72514	289	2.90217	271	0.00968	12.9	1.0651	1.6
1.768	2.72797	290	2.90479	271	0.00969	12.9	1.0649	1.6
1.769	2.73080	290	2.90741	271	0.00970	12.9	1.0648	1.6
1.770	2.73363	290	2.91003	272	0.00971	12.9	1.0646	1.6
1.771	2.73646	290	2.91265	272	0.00972	12.9	1.0645	1.6
1.772	2.73929	291	2.91527	272	0.00973	12.9	1.0643	1.6
1.773	2.74212	291	2.91789	272	0.00974	12.9	1.0642	1.6
1.774	2.74495	291	2.92051	273	0.00975	12.9	1.0640	1.6
1.775	2.74778	291	2.92313	273	0.00976	12.9	1.0639	1.6
1.776	2.75061	292	2.92575	273	0.00977	12.9	1.0637	1.6
1.777	2.75344	292	2.92837	273	0.00978	12.9	1.0636	1.6
1.778	2.75627	292	2.93099	274	0.00979	12.9	1.0634	1.6
1.779	2.75910	292	2.93361	274	0.00980	12.9	1.0633	1.6
1.780	2.76193	293	2.93623	274	0.00981	12.9	1.0631	1.6
1.781	2.76476	293	2.93885	274	0.00982	12.9	1.0630	1.6
1.782	2.76759	293	2.94147	275	0.00983	12.9	1.0628	1.6
1.783	2.77042	293	2.94409	275	0.00984	12.9	1.0627	1.6
1.784	2.77325	294	2.94671	275	0.00985	12.9	1.0625	1.6
1.785	2.77608	294	2.94933	275	0.00986	12.9	1.0624	1.6
1.786	2.77891	294	2.95195	276	0.00987	12.9	1.0622	1.6
1.787	2.78174	294	2.95457	276	0.00988	12.9	1.0621	1.6
1.788	2.78457	295	2.95719	276	0.00989	12.9	1.0619	1.6
1.789	2.78740	295	2.95981	276	0.00990	12.9	1.0618	1.6
1.790	2.79023	295	2.96243	277	0.00991	12.9	1.0616	1.6
1.791	2.79306	295	2.96505	277	0.00992	12.9	1.0615	1.6
1.792	2.79589	296	2.96767	277	0.00993	12.9	1.0613	1.6
1.793	2.79872	296	2.97029	277	0.00994	12.9	1.0612	1.6
1.794	2.80155	296	2.97291	278	0.00995	12.9	1.0610	1.6
1.795	2.80438	296	2.97553	278	0.00996	12.9	1.0609	1.6
1.796	2.80721	297	2.97815	278	0.00997	12.9	1.0607	1.6
1.797	2.81004	297	2.98077	278	0.00998	12.9	1.0606	1.6
1.798	2.81287	297	2.98339	279	0.00999	12.9	1.0604	1.6
1.799	2.81570	297	2.98601	279	0.01000	12.9	1.0603	1.6
1.800	2.81853	298	2.98863	279	0.01001	12.9	1.0601	1.6

Natural Hyperbolic Functions.

u	$\sinh u$	$u F_1'$	$\cosh u$	$u F_2'$	$\tanh u$	$u F_3'$	$\coth u$	$u F_4'$
1.700	2.64953	283	2.821832	265	0.93541	12.5	1.0691	1.4
1.701	2.64846	283	2.82096	265	0.93533	12.5	1.0690	1.4
1.702	2.64739	283	2.82009	265	0.93525	12.5	1.0689	1.4
1.703	2.64632	284	2.81922	265	0.93518	12.4	1.0688	1.4
1.704	2.64525	284	2.81835	265	0.93510	12.4	1.0687	1.4
1.705	2.64418	284	2.81748	265	0.93503	12.4	1.0686	1.4
1.706	2.64311	284	2.81661	265	0.93495	12.4	1.0685	1.4
1.707	2.64204	285	2.81574	267	0.93488	12.3	1.0684	1.4
1.708	2.64097	285	2.81487	267	0.93480	12.3	1.0683	1.4
1.709	2.63990	285	2.81400	267	0.93473	12.3	1.0682	1.4
1.710	2.63883	285	2.81313	267	0.93465	12.3	1.0681	1.4
1.711	2.63776	285	2.81226	268	0.93458	12.2	1.0680	1.4
1.712	2.63669	285	2.81139	268	0.93450	12.2	1.0679	1.4
1.713	2.63562	285	2.81052	268	0.93443	12.2	1.0678	1.4
1.714	2.63455	287	2.80965	269	0.93435	12.2	1.0677	1.4
1.715	2.63348	287	2.80878	269	0.93428	12.2	1.0676	1.4
1.716	2.63241	287	2.80791	269	0.93420	12.1	1.0675	1.4
1.717	2.63134	287	2.80704	269	0.93413	12.1	1.0674	1.4
1.718	2.63027	288	2.80617	270	0.93405	12.1	1.0673	1.4
1.719	2.62920	288	2.80530	270	0.93398	12.1	1.0672	1.4
1.720	2.62813	288	2.80443	270	0.93390	12.0	1.0671	1.4
1.721	2.62706	288	2.80356	271	0.93383	12.0	1.0670	1.4
1.722	2.62599	289	2.80269	271	0.93375	12.0	1.0669	1.4
1.723	2.62492	289	2.80182	271	0.93368	12.0	1.0668	1.4
1.724	2.62385	289	2.80095	271	0.93360	12.0	1.0667	1.4
1.725	2.62278	290	2.80008	272	0.93353	11.9	1.0666	1.4
1.726	2.62171	290	2.79921	272	0.93345	11.9	1.0665	1.4
1.727	2.62064	290	2.79834	273	0.93338	11.9	1.0664	1.3
1.728	2.61957	290	2.79747	273	0.93330	11.9	1.0663	1.3
1.729	2.61850	291	2.79660	273	0.93323	11.8	1.0662	1.3
1.730	2.61743	291	2.79573	273	0.93315	11.8	1.0661	1.3
1.731	2.61636	291	2.79486	273	0.93308	11.8	1.0660	1.3
1.732	2.61529	291	2.79399	274	0.93300	11.8	1.0659	1.3
1.733	2.61422	292	2.79312	274	0.93293	11.8	1.0658	1.3
1.734	2.61315	292	2.79225	274	0.93285	11.7	1.0657	1.3
1.735	2.61208	292	2.79138	275	0.93278	11.7	1.0656	1.3
1.736	2.61101	293	2.79051	275	0.93270	11.7	1.0655	1.3
1.737	2.60994	293	2.78964	275	0.93263	11.7	1.0654	1.3
1.738	2.60887	293	2.78877	276	0.93255	11.6	1.0653	1.3
1.739	2.60780	293	2.78790	276	0.93248	11.6	1.0652	1.3
1.740	2.60673	294	2.78703	276	0.93240	11.6	1.0651	1.3
1.741	2.60566	294	2.78616	277	0.93233	11.6	1.0650	1.3
1.742	2.60459	294	2.78529	277	0.93225	11.6	1.0649	1.3
1.743	2.60352	294	2.78442	277	0.93218	11.5	1.0648	1.3
1.744	2.60245	295	2.78355	277	0.93210	11.5	1.0647	1.3
1.745	2.60138	295	2.78268	278	0.93203	11.5	1.0646	1.3
1.746	2.60031	295	2.78181	278	0.93195	11.5	1.0645	1.3
1.747	2.59924	296	2.78094	278	0.93188	11.4	1.0644	1.3
1.748	2.59817	296	2.78007	278	0.93180	11.4	1.0643	1.3
1.749	2.59710	296	2.77920	279	0.93173	11.4	1.0642	1.3
1.750	2.59603	296	2.77833	279	0.93165	11.4	1.0641	1.3
u	$\tanh u$	$u F_1'$	$\coth u$	$u F_2'$	$\sinh u$	$u F_3'$	$\cosh u$	$u F_4'$

Natural Hyperbolic Functions,

x	$\sinh x$	$= F_1'$	$\cosh x$	$= F_2'$	$\tanh x$	$= F_3'$	$\coth x$	$= F_4'$
1.750	2.70041	265	2.954110	279	0.91138	11.4	1.0623	1.3
.751	.70138	267	.95488	279	.91140	11.4	.0621	1.3
.752	.70235	267	.95565	280	.91142	11.4	.0620	1.3
.753	.70332	267	.95642	280	.91172	11.3	.0619	1.3
.754	.70429	268	.95719	280	.91183	11.3	.0618	1.3
1.755	2.70527	268	2.95795	281	0.91194	11.3	1.0616	1.3
.756	.70625	268	.95872	281	.91205	11.3	.0615	1.3
.757	.70721	268	.95949	281	.91217	11.2	.0614	1.3
.758	.70818	269	.96026	281	.91248	11.2	.0613	1.3
.759	.70915	269	.96103	282	.91259	11.2	.0611	1.3
1.760	2.71012	269	2.96179	282	0.91269	11.2	1.0610	1.3
.761	.71110	269	.96256	282	.91281	11.1	.0609	1.3
.762	.71207	269	.96333	283	.91273	11.1	.0608	1.3
.763	.71304	269	.96410	283	.91284	11.1	.0606	1.2
.764	.71401	269	.96487	283	.91295	11.1	.0605	1.2
1.765	2.71498	269	2.96563	284	0.91306	11.1	1.0604	1.2
.766	.71595	269	.96640	284	.91317	11.0	.0603	1.2
.767	.71692	269	.96717	284	.91328	11.0	.0601	1.2
.768	.71789	269	.96794	284	.91339	11.0	.0600	1.2
.769	.71886	269	.96871	285	.91350	11.0	.0599	1.2
1.770	2.71983	269	2.96947	285	0.91361	11.0	1.0598	1.2
.771	.71980	269	.96924	285	.91372	10.9	.0596	1.2
.772	.72077	269	.97001	286	.91383	10.9	.0595	1.2
.773	.72174	269	.97078	286	.91394	10.9	.0594	1.2
.774	.72271	269	.97155	286	.91405	10.9	.0593	1.2
1.775	2.72268	269	2.97231	287	0.91416	10.9	1.0592	1.2
.776	.72365	269	.97308	287	.91426	10.8	.0590	1.2
.777	.72462	269	.97385	287	.91437	10.8	.0589	1.2
.778	.72559	269	.97462	287	.91448	10.8	.0588	1.2
.779	.72656	269	.97539	288	.91459	10.8	.0587	1.2
1.780	2.72753	269	2.97615	288	0.91470	10.8	1.0586	1.2
.781	.72750	269	.97592	288	.91480	10.7	.0584	1.2
.782	.72847	269	.97669	289	.91491	10.7	.0583	1.2
.783	.72944	269	.97746	289	.91502	10.7	.0582	1.2
.784	.73041	269	.97823	289	.91513	10.7	.0581	1.2
1.785	2.73138	269	2.97899	290	0.91523	10.7	1.0580	1.2
.786	.73135	269	.97876	290	.91534	10.6	.0578	1.2
.787	.73232	269	.97953	290	.91544	10.6	.0577	1.2
.788	.73329	269	.98030	291	.91555	10.6	.0576	1.2
.789	.73426	269	.98107	291	.91565	10.6	.0575	1.2
1.790	2.73523	269	2.98183	291	0.91576	10.6	1.0574	1.2
.791	.73520	269	.98160	291	.91587	10.5	.0572	1.2
.792	.73617	269	.98237	292	.91597	10.5	.0571	1.2
.793	.73714	269	.98314	292	.91608	10.5	.0570	1.2
.794	.73811	269	.98391	292	.91618	10.5	.0569	1.2
1.795	2.73908	269	2.98467	293	0.91629	10.5	1.0568	1.2
.796	.73905	269	.98444	293	.91639	10.4	.0566	1.2
.797	.74002	269	.98521	293	.91650	10.4	.0565	1.2
.798	.74099	269	.98598	294	.91660	10.4	.0564	1.2
.799	.74196	269	.98675	294	.91670	10.4	.0563	1.2
1.800	2.74293	269	2.98751	294	0.91681	10.4	1.0562	1.2
x	$\sinh x$	$= F_1'$	$\cosh x$	$= F_2'$	$\tanh x$	$= F_3'$	$\coth x$	$= F_4'$

x	$\sin x$	$\cos x$	$\tan x$	$\cot x$	$\sec x$	$\csc x$
1.800	0.9717	0.2374	4.1329	0.2420	1.0383	1.0383
1.801	0.9718	0.2373	4.1330	0.2419	1.0384	1.0384
1.802	0.9719	0.2372	4.1331	0.2418	1.0385	1.0385
1.803	0.9720	0.2371	4.1332	0.2417	1.0386	1.0386
1.804	0.9721	0.2370	4.1333	0.2416	1.0387	1.0387
1.805	0.9722	0.2369	4.1334	0.2415	1.0388	1.0388
1.806	0.9723	0.2368	4.1335	0.2414	1.0389	1.0389
1.807	0.9724	0.2367	4.1336	0.2413	1.0390	1.0390
1.808	0.9725	0.2366	4.1337	0.2412	1.0391	1.0391
1.809	0.9726	0.2365	4.1338	0.2411	1.0392	1.0392
1.810	0.9727	0.2364	4.1339	0.2410	1.0393	1.0393
1.811	0.9728	0.2363	4.1340	0.2409	1.0394	1.0394
1.812	0.9729	0.2362	4.1341	0.2408	1.0395	1.0395
1.813	0.9730	0.2361	4.1342	0.2407	1.0396	1.0396
1.814	0.9731	0.2360	4.1343	0.2406	1.0397	1.0397
1.815	0.9732	0.2359	4.1344	0.2405	1.0398	1.0398
1.816	0.9733	0.2358	4.1345	0.2404	1.0399	1.0399
1.817	0.9734	0.2357	4.1346	0.2403	1.0400	1.0400
1.818	0.9735	0.2356	4.1347	0.2402	1.0401	1.0401
1.819	0.9736	0.2355	4.1348	0.2401	1.0402	1.0402
1.820	0.9737	0.2354	4.1349	0.2400	1.0403	1.0403
1.821	0.9738	0.2353	4.1350	0.2399	1.0404	1.0404
1.822	0.9739	0.2352	4.1351	0.2398	1.0405	1.0405
1.823	0.9740	0.2351	4.1352	0.2397	1.0406	1.0406
1.824	0.9741	0.2350	4.1353	0.2396	1.0407	1.0407
1.825	0.9742	0.2349	4.1354	0.2395	1.0408	1.0408
1.826	0.9743	0.2348	4.1355	0.2394	1.0409	1.0409
1.827	0.9744	0.2347	4.1356	0.2393	1.0410	1.0410
1.828	0.9745	0.2346	4.1357	0.2392	1.0411	1.0411
1.829	0.9746	0.2345	4.1358	0.2391	1.0412	1.0412
1.830	0.9747	0.2344	4.1359	0.2390	1.0413	1.0413
1.831	0.9748	0.2343	4.1360	0.2389	1.0414	1.0414
1.832	0.9749	0.2342	4.1361	0.2388	1.0415	1.0415
1.833	0.9750	0.2341	4.1362	0.2387	1.0416	1.0416
1.834	0.9751	0.2340	4.1363	0.2386	1.0417	1.0417
1.835	0.9752	0.2339	4.1364	0.2385	1.0418	1.0418
1.836	0.9753	0.2338	4.1365	0.2384	1.0419	1.0419
1.837	0.9754	0.2337	4.1366	0.2383	1.0420	1.0420
1.838	0.9755	0.2336	4.1367	0.2382	1.0421	1.0421
1.839	0.9756	0.2335	4.1368	0.2381	1.0422	1.0422
1.840	0.9757	0.2334	4.1369	0.2380	1.0423	1.0423
1.841	0.9758	0.2333	4.1370	0.2379	1.0424	1.0424
1.842	0.9759	0.2332	4.1371	0.2378	1.0425	1.0425
1.843	0.9760	0.2331	4.1372	0.2377	1.0426	1.0426
1.844	0.9761	0.2330	4.1373	0.2376	1.0427	1.0427
1.845	0.9762	0.2329	4.1374	0.2375	1.0428	1.0428
1.846	0.9763	0.2328	4.1375	0.2374	1.0429	1.0429
1.847	0.9764	0.2327	4.1376	0.2373	1.0430	1.0430
1.848	0.9765	0.2326	4.1377	0.2372	1.0431	1.0431
1.849	0.9766	0.2325	4.1378	0.2371	1.0432	1.0432
1.850	0.9767	0.2324	4.1379	0.2370	1.0433	1.0433
1.851	0.9768	0.2323	4.1380	0.2369	1.0434	1.0434
1.852	0.9769	0.2322	4.1381	0.2368	1.0435	1.0435
1.853	0.9770	0.2321	4.1382	0.2367	1.0436	1.0436
1.854	0.9771	0.2320	4.1383	0.2366	1.0437	1.0437
1.855	0.9772	0.2319	4.1384	0.2365	1.0438	1.0438
1.856	0.9773	0.2318	4.1385	0.2364	1.0439	1.0439
1.857	0.9774	0.2317	4.1386	0.2363	1.0440	1.0440
1.858	0.9775	0.2316	4.1387	0.2362	1.0441	1.0441
1.859	0.9776	0.2315	4.1388	0.2361	1.0442	1.0442
1.860	0.9777	0.2314	4.1389	0.2360	1.0443	1.0443
1.861	0.9778	0.2313	4.1390	0.2359	1.0444	1.0444
1.862	0.9779	0.2312	4.1391	0.2358	1.0445	1.0445
1.863	0.9780	0.2311	4.1392	0.2357	1.0446	1.0446
1.864	0.9781	0.2310	4.1393	0.2356	1.0447	1.0447
1.865	0.9782	0.2309	4.1394	0.2355	1.0448	1.0448
1.866	0.9783	0.2308	4.1395	0.2354	1.0449	1.0449
1.867	0.9784	0.2307	4.1396	0.2353	1.0450	1.0450
1.868	0.9785	0.2306	4.1397	0.2352	1.0451	1.0451
1.869	0.9786	0.2305	4.1398	0.2351	1.0452	1.0452
1.870	0.9787	0.2304	4.1399	0.2350	1.0453	1.0453
1.871	0.9788	0.2303	4.1400	0.2349	1.0454	1.0454
1.872	0.9789	0.2302	4.1401	0.2348	1.0455	1.0455
1.873	0.9790	0.2301	4.1402	0.2347	1.0456	1.0456
1.874	0.9791	0.2300	4.1403	0.2346	1.0457	1.0457
1.875	0.9792	0.2299	4.1404	0.2345	1.0458	1.0458
1.876	0.9793	0.2298	4.1405	0.2344	1.0459	1.0459
1.877	0.9794	0.2297	4.1406	0.2343	1.0460	1.0460
1.878	0.9795	0.2296	4.1407	0.2342	1.0461	1.0461
1.879	0.9796	0.2295	4.1408	0.2341	1.0462	1.0462
1.880	0.9797	0.2294	4.1409	0.2340	1.0463	1.0463
1.881	0.9798	0.2293	4.1410	0.2339	1.0464	1.0464
1.882	0.9799	0.2292	4.1411	0.2338	1.0465	1.0465
1.883	0.9800	0.2291	4.1412	0.2337	1.0466	1.0466
1.884	0.9801	0.2290	4.1413	0.2336	1.0467	1.0467
1.885	0.9802	0.2289	4.1414	0.2335	1.0468	1.0468
1.886	0.9803	0.2288	4.1415	0.2334	1.0469	1.0469
1.887	0.9804	0.2287	4.1416	0.2333	1.0470	1.0470
1.888	0.9805	0.2286	4.1417	0.2332	1.0471	1.0471
1.889	0.9806	0.2285	4.1418	0.2331	1.0472	1.0472
1.890	0.9807	0.2284	4.1419	0.2330	1.0473	1.0473
1.891	0.9808	0.2283	4.1420	0.2329	1.0474	1.0474
1.892	0.9809	0.2282	4.1421	0.2328	1.0475	1.0475
1.893	0.9810	0.2281	4.1422	0.2327	1.0476	1.0476
1.894	0.9811	0.2280	4.1423	0.2326	1.0477	1.0477
1.895	0.9812	0.2279	4.1424	0.2325	1.0478	1.0478
1.896	0.9813	0.2278	4.1425	0.2324	1.0479	1.0479
1.897	0.9814	0.2277	4.1426	0.2323	1.0480	1.0480
1.898	0.9815	0.2276	4.1427	0.2322	1.0481	1.0481
1.899	0.9816	0.2275	4.1428	0.2321	1.0482	1.0482
1.900	0.9817	0.2274	4.1429	0.2320	1.0483	1.0483

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	lnsh u	= F ₃ '	csch u	= F ₄ '
1.850	3.10120	326	3.25853	310	0.95175	9.1	1.0907	1.0
.851	.00155	326	.26103	310	.95184	9.1	.0907	1.0
.852	.00761	326	.26124	311	.95193	9.1	.0905	1.0
.853	.11108	327	.26185	311	.95203	9.1	.0901	1.0
.854	.11415	327	.26206	311	.95212	9.3	.0903	1.0
1.855	3.11762	327	3.27408	312	0.95221	9.3	1.0902	1.0
.856	.12000	328	.27710	312	.95231	9.3	.0901	1.0
.857	.12118	328	.28032	312	.95240	9.3	.0900	1.0
.858	.12236	328	.28141	313	.95249	9.3	.0109	1.0
.859	.12374	329	.28557	313	.95259	9.3	.0108	1.0
1.860	3.13493	329	3.29790	313	0.95268	9.2	1.0107	1.0
.861	.12732	329	.29281	314	.95277	9.2	.0106	1.0
.862	.12962	329	.29598	314	.95286	9.2	.0105	1.0
.863	.13192	329	.29912	314	.95296	9.2	.0104	1.0
.864	.13422	329	.30227	315	.95305	9.2	.0103	1.0
1.865	3.15052	331	3.30512	315	0.95314	9.2	1.0102	1.0
.866	.13583	331	.30857	315	.95323	9.1	.0101	1.0
.867	.13714	331	.31172	316	.95332	9.1	.0100	1.0
.868	.13945	331	.31488	316	.95341	9.1	.0100	1.0
.869	.14277	332	.31803	316	.95350	9.1	.0101	1.0
1.870	3.16700	332	3.32121	317	0.95359	9.1	1.0100	1.0
.871	.14501	332	.32438	317	.95368	9.0	.0100	1.0
.872	.14732	333	.32755	317	.95378	9.0	.0100	1.0
.873	.14966	333	.33071	318	.95387	9.0	.0101	1.0
.874	.15200	333	.33390	318	.95396	9.0	.0101	1.0
1.875	3.18373	334	3.33709	318	0.95405	9.0	1.0100	1.0
.876	.15507	334	.34042	319	.95414	9.0	.0101	1.0
.877	.15741	334	.34366	319	.95423	8.9	.0100	1.0
.878	.16076	335	.34685	319	.95432	8.9	.0100	1.0
.879	.16311	335	.35003	320	.95440	8.9	.0100	1.0
1.880	3.20046	335	3.35305	320	0.95449	8.9	1.0100	1.0
.881	.16581	336	.35625	320	.95458	8.9	.0100	1.0
.882	.16817	336	.35946	321	.95467	8.9	.0100	1.0
.883	.17053	336	.36266	321	.95476	8.8	.0100	1.0
.884	.17290	337	.36588	321	.95485	8.8	.0100	1.0
1.885	3.21726	337	3.36900	322	0.95493	8.8	1.0100	1.0
.886	.17603	337	.37211	322	.95502	8.8	.0100	1.0
.887	.17841	338	.37533	322	.95511	8.8	.0100	1.0
.888	.18079	338	.37856	323	.95520	8.8	.0100	1.0
.889	.18316	338	.38179	323	.95529	8.7	.0101	1.0
1.890	3.23115	339	3.38522	323	0.95537	8.7	1.0100	1.0
.891	.18573	339	.38496	324	.95546	8.7	.0100	1.0
.892	.18803	339	.38820	324	.95555	8.7	.0100	1.0
.893	.19032	339	.39144	324	.95563	8.7	.0100	1.0
.894	.19272	340	.39468	325	.95572	8.7	.0100	0.9
1.895	3.25112	340	3.40843	325	0.95581	8.6	1.0100	0.9
.896	.19512	340	.39769	325	.95590	8.6	.0100	0.9
.897	.19752	341	.40091	326	.95598	8.6	.0100	0.9
.898	.19993	341	.41420	326	.95607	8.6	.0100	0.9
.899	.20235	341	.41747	326	.95615	8.6	.0100	0.9
1.900	3.26806	342	3.41773	327	0.95624	8.6	1.0100	0.9
u	lnsh u	= F ₁ '	csch u	= F ₂ '	sinh u	= F ₃ '	csch u	= F ₄ '

Natural Hyperbolic Functions.

u	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$
1.000	3.28316	342	3.41773	347	0.99721	8.5	1.0158	0.9
.001	.27158	342	.41100	347	.99932	8.5	.0157	0.9
.002	.27590	342	.42427	348	.99941	8.5	.0156	0.9
.003	.27643	343	.42755	348	.99949	8.5	.0155	0.9
.004	.28186	343	.43083	348	.99958	8.5	.0154	0.9
1.005	3.28529	343	3.43112	349	0.99966	8.5	1.0153	0.9
.006	.28573	344	.43740	349	.99975	8.5	.0152	0.9
.007	.29017	344	.44109	349	.99983	8.5	.0151	0.9
.008	.29561	344	.44369	350	.99992	8.5	.0150	0.9
.009	.29906	345	.44728	350	.99999	8.5	.0149	0.9
1.010	3.29250	345	3.45038	350	0.99999	8.5	1.0148	0.9
.011	.29506	345	.45389	351	.99997	8.5	.0147	0.9
.012	.29941	346	.45720	351	.99995	8.5	.0147	0.9
.013	.31287	346	.46051	351	.99993	8.5	.0146	0.9
.014	.31633	346	.46382	352	.99991	8.5	.0145	0.9
1.015	3.31080	347	3.46714	352	0.99990	8.5	1.0144	0.9
.016	.32327	347	.47045	352	.99989	8.5	.0143	0.9
.017	.32774	347	.47376	353	.99987	8.5	.0142	0.9
.018	.33021	348	.47712	353	.99985	8.5	.0141	0.9
.019	.33369	348	.48045	353	.99983	8.5	.0140	0.9
1.020	3.33718	348	3.48378	354	0.99982	8.5	1.0139	0.9
.021	.34066	349	.48712	354	.99980	8.5	.0138	0.9
.022	.34415	349	.49046	354	.99978	8.5	.0138	0.9
.023	.34764	349	.49381	355	.99976	8.5	.0137	0.9
.024	.35114	350	.49716	355	.99975	8.5	.0136	0.9
1.025	3.35461	350	3.50051	355	0.99973	8.5	1.0135	0.9
.026	.35811	350	.50387	356	.99971	8.5	.0134	0.9
.027	.36161	351	.50723	356	.99969	8.5	.0133	0.9
.028	.36511	351	.51059	357	.99967	8.5	.0132	0.9
.029	.36867	351	.51395	357	.99965	8.5	.0131	0.9
1.030	3.37218	352	3.51731	357	0.99963	8.5	1.0130	0.9
.031	.37570	352	.52070	358	.99961	8.5	.0129	0.9
.032	.37922	352	.52408	358	.99959	8.5	.0129	0.9
.033	.38273	353	.52746	358	.99957	8.5	.0128	0.9
.034	.38628	353	.53085	359	.99955	8.5	.0127	0.9
1.035	3.38981	353	3.53123	359	0.99954	8.5	1.0126	0.9
.036	.39333	354	.53461	359	.99952	8.5	.0125	0.9
.037	.39689	354	.53802	360	.99950	8.5	.0124	0.9
.038	.40041	354	.54142	360	.99948	8.5	.0123	0.9
.039	.40397	355	.54482	360	.99946	8.5	.0123	0.9
1.040	3.40732	355	3.55123	361	0.99945	8.5	1.0122	0.9
.041	.41108	355	.55461	361	.99943	8.5	.0121	0.9
.042	.41463	356	.55805	361	.99941	8.5	.0120	0.9
.043	.41810	356	.56147	362	.99939	8.5	.0119	0.9
.044	.42176	356	.56490	362	.99937	8.5	.0118	0.9
1.045	3.42532	357	3.56831	363	0.99936	8.5	1.0117	0.9
.046	.42880	357	.57174	363	.99934	8.5	.0117	0.9
.047	.43247	358	.57517	363	.99932	8.5	.0116	0.9
.048	.43606	358	.57860	364	.99930	8.5	.0115	0.9
.049	.43962	358	.58203	364	.99928	8.5	.0114	0.9
1.050	3.44321	359	3.58548	364	0.99927	8.5	1.0113	0.8
u	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$

Natural Hyperbolic Functions.

u	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$	$\tanh u$	$= F_3'$	$\coth u$	$= F_4'$
1.000	1.17321	350	1.54308	344	0.76159	7.8	1.3131	0.8
1.050	1.15727	350	1.52811	345	0.76040	7.8	1.3112	
1.100	1.14131	350	1.51312	345	0.75921	7.7	1.3111	
1.150	1.12534	350	1.49811	345	0.75802	7.7	1.3111	
1.200	1.10937	350	1.48311	345	0.75683	7.7	1.3110	
1.250	1.09340	350	1.46811	345	0.75564	7.7	1.3109	
1.300	1.07743	350	1.45311	345	0.75445	7.6	1.3108	
1.350	1.06146	350	1.43811	345	0.75326	7.6	1.3107	
1.400	1.04549	350	1.42311	345	0.75207	7.6	1.3106	
1.450	1.02952	350	1.40811	345	0.75088	7.6	1.3105	
1.500	1.01355	350	1.39311	345	0.74969	7.6	1.3104	
1.550	0.99758	350	1.37811	345	0.74850	7.5	1.3103	
1.600	0.98161	350	1.36311	345	0.74731	7.5	1.3102	
1.650	0.96564	350	1.34811	345	0.74612	7.5	1.3101	
1.700	0.94967	350	1.33311	345	0.74493	7.5	1.3100	
1.750	0.93370	350	1.31811	345	0.74374	7.5	1.3099	
1.800	0.91773	350	1.30311	345	0.74255	7.4	1.3098	
1.850	0.90176	350	1.28811	345	0.74136	7.4	1.3097	
1.900	0.88579	350	1.27311	345	0.74017	7.4	1.3096	
1.950	0.86982	350	1.25811	345	0.73898	7.4	1.3095	
2.000	0.85385	350	1.24311	345	0.73779	7.4	1.3094	
2.050	0.83788	350	1.22811	345	0.73660	7.3	1.3093	
2.100	0.82191	350	1.21311	345	0.73541	7.3	1.3092	
2.150	0.80594	350	1.19811	345	0.73422	7.3	1.3091	
2.200	0.78997	350	1.18311	345	0.73303	7.3	1.3090	
2.250	0.77400	350	1.16811	345	0.73184	7.2	1.3089	
2.300	0.75803	350	1.15311	345	0.73065	7.2	1.3088	
2.350	0.74206	350	1.13811	345	0.72946	7.2	1.3087	
2.400	0.72609	350	1.12311	345	0.72827	7.2	1.3086	
2.450	0.71012	350	1.10811	345	0.72708	7.1	1.3085	
2.500	0.69415	350	1.09311	345	0.72589	7.1	1.3084	
2.550	0.67818	350	1.07811	345	0.72470	7.1	1.3083	
2.600	0.66221	350	1.06311	345	0.72351	7.1	1.3082	
2.650	0.64624	350	1.04811	345	0.72232	7.1	1.3081	
2.700	0.63027	350	1.03311	345	0.72113	7.1	1.3080	
2.750	0.61430	350	1.01811	345	0.71994	7.1	1.3079	
2.800	0.59833	350	1.00311	345	0.71875	7.1	1.3078	
2.850	0.58236	350	0.98811	345	0.71756	7.1	1.3077	
2.900	0.56639	350	0.97311	345	0.71637	7.1	1.3076	
2.950	0.55042	350	0.95811	345	0.71518	7.1	1.3075	
3.000	0.53445	350	0.94311	345	0.71399	7.1	1.3074	
3.050	0.51848	350	0.92811	345	0.71280	7.1	1.3073	
3.100	0.50251	350	0.91311	345	0.71161	7.1	1.3072	
3.150	0.48654	350	0.89811	345	0.71042	7.1	1.3071	
3.200	0.47057	350	0.88311	345	0.70923	7.1	1.3070	
3.250	0.45460	350	0.86811	345	0.70804	7.1	1.3069	
3.300	0.43863	350	0.85311	345	0.70685	7.1	1.3068	
3.350	0.42266	350	0.83811	345	0.70566	7.1	1.3067	
3.400	0.40669	350	0.82311	345	0.70447	7.1	1.3066	
3.450	0.39072	350	0.80811	345	0.70328	7.1	1.3065	
3.500	0.37475	350	0.79311	345	0.70209	7.1	1.3064	
3.550	0.35878	350	0.77811	345	0.70090	7.1	1.3063	
3.600	0.34281	350	0.76311	345	0.69971	7.1	1.3062	
3.650	0.32684	350	0.74811	345	0.69852	7.1	1.3061	
3.700	0.31087	350	0.73311	345	0.69733	7.1	1.3060	
3.750	0.29490	350	0.71811	345	0.69614	7.1	1.3059	
3.800	0.27893	350	0.70311	345	0.69495	7.1	1.3058	
3.850	0.26296	350	0.68811	345	0.69376	7.1	1.3057	
3.900	0.24699	350	0.67311	345	0.69257	7.1	1.3056	
3.950	0.23102	350	0.65811	345	0.69138	7.1	1.3055	
4.000	0.21505	350	0.64311	345	0.69019	7.1	1.3054	
4.050	0.19908	350	0.62811	345	0.68900	7.1	1.3053	
4.100	0.18311	350	0.61311	345	0.68781	7.1	1.3052	
4.150	0.16714	350	0.59811	345	0.68662	7.1	1.3051	
4.200	0.15117	350	0.58311	345	0.68543	7.1	1.3050	
4.250	0.13520	350	0.56811	345	0.68424	7.1	1.3049	
4.300	0.11923	350	0.55311	345	0.68305	7.1	1.3048	
4.350	0.10326	350	0.53811	345	0.68186	7.1	1.3047	
4.400	0.08729	350	0.52311	345	0.68067	7.1	1.3046	
4.450	0.07132	350	0.50811	345	0.67948	7.1	1.3045	
4.500	0.05535	350	0.49311	345	0.67829	7.1	1.3044	
4.550	0.03938	350	0.47811	345	0.67710	7.1	1.3043	
4.600	0.02341	350	0.46311	345	0.67591	7.1	1.3042	
4.650	0.00744	350	0.44811	345	0.67472	7.1	1.3041	
4.700	-0.00853	350	0.43311	345	0.67353	7.1	1.3040	
4.750	-0.02456	350	0.41811	345	0.67234	7.1	1.3039	
4.800	-0.04059	350	0.40311	345	0.67115	7.1	1.3038	
4.850	-0.05662	350	0.38811	345	0.66996	7.1	1.3037	
4.900	-0.07265	350	0.37311	345	0.66877	7.1	1.3036	
4.950	-0.08868	350	0.35811	345	0.66758	7.1	1.3035	
5.000	-0.10471	350	0.34311	345	0.66639	7.1	1.3034	
5.050	-0.12074	350	0.32811	345	0.66520	7.1	1.3033	
5.100	-0.13677	350	0.31311	345	0.66401	7.1	1.3032	
5.150	-0.15280	350	0.29811	345	0.66282	7.1	1.3031	
5.200	-0.16883	350	0.28311	345	0.66163	7.1	1.3030	
5.250	-0.18486	350	0.26811	345	0.66044	7.1	1.3029	
5.300	-0.20089	350	0.25311	345	0.65925	7.1	1.3028	
5.350	-0.21692	350	0.23811	345	0.65806	7.1	1.3027	
5.400	-0.23295	350	0.22311	345	0.65687	7.1	1.3026	
5.450	-0.24898	350	0.20811	345	0.65568	7.1	1.3025	
5.500	-0.26501	350	0.19311	345	0.65449	7.1	1.3024	
5.550	-0.28104	350	0.17811	345	0.65330	7.1	1.3023	
5.600	-0.29707	350	0.16311	345	0.65211	7.1	1.3022	
5.650	-0.31310	350	0.14811	345	0.65092	7.1	1.3021	
5.700	-0.32913	350	0.13311	345	0.64973	7.1	1.3020	
5.750	-0.34516	350	0.11811	345	0.64854	7.1	1.3019	
5.800	-0.36119	350	0.10311	345	0.64735	7.1	1.3018	
5.850	-0.37722	350	0.08811	345	0.64616	7.1	1.3017	
5.900	-0.39325	350	0.07311	345	0.64497	7.1	1.3016	
5.950	-0.40928	350	0.05811	345	0.64378	7.1	1.3015	
6.000	-0.42531	350	0.04311	345	0.64259	7.1	1.3014	
6.050	-0.44134	350	0.02811	345	0.64140	7.1	1.3013	
6.100	-0.45737	350	0.01311	345	0.64021	7.1	1.3012	
6.150	-0.47340	350	0.00811	345	0.63902	7.1	1.3011	
6.200	-0.48943	350	0.00311	345	0.63783	7.1	1.3010	
6.250	-0.50546	350	0.00811	345	0.63664	7.1	1.3009	
6.300	-0.52149	350	0.01311	345	0.63545	7.1	1.3008	
6.350	-0.53752	350	0.01811	345	0.63426	7.1	1.3007	
6.400	-0.55355	350	0.02311	345	0.63307	7.1	1.3006	
6.450	-0.56958	350	0.02811	345	0.63188	7.1	1.3005	
6.500	-0.58561	350	0.03311	345	0.63069	7.1	1.3004	
6.550	-0.60164	350	0.03811	345	0.62950	7.1	1.3003	
6.600	-0.61767	350	0.04311	345	0.62831	7.1	1.3002	
6.650	-0.63370	350	0.04811	345	0.62712	7.1	1.3001	
6.700	-0.64973	350	0.05311	345	0.62593	7.1	1.3000	
6.750	-0.66576	350	0.05811	345	0.62474	7.1	1.2999	
6.800	-0.68179	350	0.06311	345	0.62355	7.1	1.2998	
6.850	-0.69782	350	0.06811	345	0.62236	7.1	1.2997	
6.900	-0.71385	350	0.07311	345	0.62117	7.1	1.2996	
6.950	-0.72988	350	0.07811	345	0.61998	7.1	1.2995	
7.000	-0.74591	350	0.08311	345	0.61879	7.1	1.2994	
7.050	-0.76194	350	0.08811	345	0.61760	7.1	1.2993	
7.100	-0.77797	350	0.09311	345	0.61641	7.1	1.2992	
7.150	-0.79400	350	0.09811	345	0.61522	7.1	1.2991	
7.200	-0.81003	350	0.10311	345	0.61403	7.1	1.2990	
7.250	-0.82606	350	0.10811	345	0.61284	7.1	1.2989	
7.300	-0.84209	350	0.11311	345	0.61165	7.1	1.2988	
7.350	-0.85812	350	0.11811	345	0.61046	7.1	1.2987	
7.400	-0.87415	350	0.12311	345	0.60927	7.1	1.2986	
7.450	-0.89018	350	0.12811	345	0.60808	7.1	1.2985	
7.500	-0.90621	350	0.13311	345	0.60689	7.1	1.2984	
7.550	-0.92224	350	0.13811	345	0.60570	7.1	1.2983	
7.600	-0.93827	350	0.14311	345	0.60451	7.1	1.2982	
7.650	-0.95430	350	0.14811	345	0.60332	7.1	1.2981	</

Natural Hyperbolic Functions.

u	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$	$\tanh u$	$= F_3'$	$\coth u$	$= F_4'$
2.000	3.66286	376	3.76220	373	0.97103	7.1	1.0273	0.8
.001	.00000	377	.76582	373	.00110	7.1	.0272	
.002	.00139	377	.76641	373	.00117	7.0	.0272	
.003	.00388	377	.77309	371	.00121	7.0	.0271	
.004	.00404	376	.77773	371	.00131	7.0	.0270	
2.005	3.66572	378	3.78038	375	0.97038	7.0	1.0269	0.8
.006	.60590	378	.78102	375	.00145	7.0	.0268	0.8
.007	.65135	379	.78568	375	.00152	7.0	.0268	0.7
.008	.69507	379	.79133	376	.00159	7.0	.0267	
.009	.66607	379	.79499	376	.00166	6.9	.0266	
2.010	3.66966	380	3.79815	376	0.96973	6.9	1.0265	0.7
.011	.66816	380	.80232	377	.00180	6.9	.0265	
.012	.67227	381	.80599	377	.00187	6.9	.0264	
.013	.67608	381	.80966	378	.00193	6.9	.0263	
.014	.67989	381	.81334	378	.00200	6.9	.0263	
2.015	3.68370	382	3.81702	378	0.96907	6.9	1.0262	0.7
.016	.68352	382	.82071	379	.00211	6.9	.0261	
.017	.69134	382	.82330	379	.00218	6.8	.0260	
.018	.69517	383	.82800	379	.00225	6.8	.0260	
.019	.69600	383	.83179	379	.00235	6.8	.0259	
2.020	3.70883	384	3.83549	379	0.96841	6.8	1.0258	0.7
.021	.70697	384	.83919	379	.00248	6.8	.0258	
.022	.70951	384	.84290	379	.00255	6.8	.0257	
.023	.71436	385	.84662	379	.00262	6.8	.0256	
.024	.71821	385	.85033	372	.00268	6.7	.0255	
2.025	3.72206	385	3.85995	372	0.96875	6.7	1.0255	0.7
.026	.72591	386	.85778	371	.00282	6.7	.0254	
.027	.72927	386	.86150	371	.00289	6.7	.0253	
.028	.73364	387	.86521	371	.00295	6.7	.0253	
.029	.73750	387	.86892	371	.00302	6.7	.0252	
2.030	3.74138	387	3.87271	371	0.96809	6.7	1.0251	0.7
.031	.74525	388	.87645	375	.00315	6.7	.0250	
.032	.74913	388	.88020	375	.00322	6.6	.0250	
.033	.75301	388	.88395	375	.00329	6.6	.0249	
.034	.75690	389	.88771	376	.00335	6.6	.0248	
2.035	3.76079	389	3.89127	376	0.96742	6.6	1.0247	0.7
.036	.76468	390	.89521	376	.00348	6.6	.0247	
.037	.76858	390	.89900	377	.00355	6.6	.0246	
.038	.77248	390	.90277	377	.00362	6.6	.0245	
.039	.77638	391	.90654	378	.00368	6.6	.0245	
2.040	3.78029	391	3.91032	378	0.96675	6.5	1.0244	0.7
.041	.78420	391	.91410	378	.00381	6.5	.0243	
.042	.78812	392	.91789	379	.00388	6.5	.0243	
.043	.79204	392	.92168	379	.00394	6.5	.0242	
.044	.79596	393	.92547	380	.00401	6.5	.0241	
2.045	3.79989	393	3.92927	380	0.96607	6.5	1.0240	0.7
.046	.80382	393	.93317	380	.00414	6.5	.0240	
.047	.80776	394	.93708	381	.00420	6.5	.0239	
.048	.81169	394	.94099	381	.00427	6.4	.0238	
.049	.81562	394	.94490	382	.00433	6.4	.0238	
2.050	3.81958	395	3.94832	382	0.96540	6.4	1.0237	0.7
u	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$	$\tanh u$	$= F_3'$	$\coth u$	$= F_4'$

SMITHSONIAN TABLES

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	cath u	= F ₄ '
2.090	3.81058	395	3.94832	382	0.96740	6.4	1.0337	0.7
.051	.84353	395	.95214	382	.96746	6.4	.0335	
.052	.84749	396	.95507	383	.96752	6.4	.0336	
.053	.85145	396	.95799	383	.96759	6.4	.0335	
.054	.85541	396	.96093	384	.96765	6.4	.0334	
2.095	3.83037	397	3.96747	384	0.96771	6.4	1.0334	0.7
.096	.84334	397	.97131	384	.96778	6.3	.0333	
.057	.84732	398	.97513	384	.96784	6.3	.0332	
.058	.85129	398	.97900	384	.96790	6.3	.0332	
.059	.85527	398	.98285	385	.96797	6.3	.0331	
2.099	3.85026	399	3.98571	385	0.96803	6.3	1.0330	0.7
.061	.85325	399	.99057	385	.96809	6.3	.0330	
.062	.85724	399	.99444	387	.96816	6.3	.0329	
.063	.86124	400	.99831	387	.96822	6.3	.0328	
.064	.86524	400	1.00218	388	.96828	6.2	.0328	
2.065	3.87924	401	4.00606	388	0.96834	6.2	1.0327	0.7
.066	.88323	401	.00994	388	.96841	6.2	.0326	
.067	.88722	401	.01382	389	.96847	6.2	.0326	
.068	.89122	402	.01771	389	.96853	6.2	.0325	
.069	.89520	402	.02161	390	.96859	6.2	.0324	
2.070	3.89932	403	4.03550	390	0.96865	6.2	1.0324	0.7
.071	.90335	403	.02941	390	.96872	6.2	.0323	
.072	.90739	403	.03331	391	.96878	6.1	.0322	
.073	.91141	404	.03722	391	.96884	6.1	.0322	
.074	.91545	404	.04113	392	.96890	6.1	.0321	
2.075	3.91930	405	4.04505	392	0.96896	6.1	1.0320	0.7
.076	.92334	405	.04897	392	.96902	6.1	.0320	0.6
.077	.92739	405	.05290	393	.96908	6.1	.0319	
.078	.93145	406	.05683	393	.96914	6.1	.0318	
.079	.93551	406	.06076	394	.96920	6.1	.0318	
2.080	3.93977	406	4.06470	394	0.96926	6.1	1.0317	0.6
.081	.94384	407	.06864	394	.96933	6.0	.0316	
.082	.94791	407	.07259	395	.96939	6.0	.0316	
.083	.95198	408	.07654	395	.96945	6.0	.0315	
.084	.95606	408	.08050	396	.96951	6.0	.0315	
2.085	3.95914	408	4.08445	396	0.96957	6.0	1.0314	0.6
.086	.96323	409	.08841	396	.96963	6.0	.0313	
.087	.96732	409	.09238	397	.96969	6.0	.0313	
.088	.97141	410	.09635	397	.96975	6.0	.0312	
.089	.97551	410	.10032	398	.96980	5.9	.0311	
2.090	3.98061	410	4.10439	398	0.96986	5.9	1.0311	0.6
.091	.98472	411	.10838	398	.96992	5.9	.0310	
.092	.98883	411	.11237	399	.96998	5.9	.0309	
.093	.99294	412	.11636	399	.97004	5.9	.0309	
.094	.99706	412	.12035	400	.97010	5.9	.0308	
2.095	4.00119	412	4.12425	400	0.97016	5.9	1.0308	0.6
.096	.00531	413	.12835	401	.97022	5.9	.0307	
.097	.00944	413	.13237	401	.97028	5.9	.0306	
.098	.01358	414	.13638	401	.97034	5.8	.0306	
.099	.01771	414	.14039	402	.97039	5.8	.0305	
2.100	4.02185	414	4.14431	402	0.97045	5.8	1.0304	0.6
u	tan u	= F ₁ '	sec u	= F ₂ '	sin u	= F ₃ '	csc u	= F ₄ '

Natural Hyperbolic Functions.

x	$\sinh x$	$= F_1'$	$\cosh x$	$= F_2'$	$\tanh x$	$= F_3'$	$\coth x$	$= F_4'$
2.100	4.02186	414	4.14431	402	0.97045	5.8	1.0304	0.6
.101	.02500	415	.14834	403	.07051	5.8	.0304	
.102	.03015	415	.15437	403	.07057	5.8	.0303	
.103	.03431	416	.15940	403	.07063	5.8	.0303	
.104	.03847	416	.16043	404	.07068	5.8	.0302	
2.105	4.04263	416	4.16147	404	0.97074	5.8	1.0301	0.6
.106	.04680	417	.16852	405	.07080	5.8	.0301	
.107	.05097	417	.17257	405	.07086	5.7	.0300	
.108	.05514	418	.17662	406	.07091	5.7	.0300	
.109	.05932	418	.18068	406	.07097	5.7	.0299	
2.110	4.06350	418	4.18174	406	0.97103	5.7	1.0298	0.6
.111	.06769	419	.18881	407	.07109	5.7	.0298	
.112	.07188	419	.19288	407	.07114	5.7	.0297	
.113	.07607	420	.19695	408	.07120	5.7	.0297	
.114	.08027	420	.20103	408	.07126	5.7	.0296	
2.115	4.08446	421	4.20511	408	0.97131	5.7	1.0295	0.6
.116	.08868	421	.20920	409	.07137	5.6	.0295	
.117	.09289	421	.21329	409	.07143	5.6	.0294	
.118	.09711	422	.21738	410	.07148	5.6	.0294	
.119	.10133	422	.22148	410	.07154	5.6	.0293	
2.120	4.10555	423	4.22558	411	0.97159	5.6	1.0292	0.6
.121	.10978	423	.22969	411	.07165	5.6	.0292	
.122	.11401	423	.23380	411	.07171	5.6	.0291	
.123	.11825	424	.23794	412	.07176	5.6	.0291	
.124	.12249	424	.24204	412	.07182	5.6	.0290	
2.125	4.12673	425	4.24617	413	0.97187	5.5	1.0289	0.6
.126	.13098	425	.25029	413	.07193	5.5	.0289	
.127	.13523	425	.25443	414	.07198	5.5	.0288	
.128	.13949	426	.25856	414	.07204	5.5	.0288	
.129	.14375	426	.26271	414	.07209	5.5	.0287	
2.130	4.14891	427	4.26683	415	0.97215	5.5	1.0286	0.6
.131	.14823	427	.27099	415	.07220	5.5	.0286	
.132	.15246	428	.27516	416	.07226	5.5	.0285	
.133	.15663	428	.27932	416	.07231	5.5	.0285	
.134	.16082	428	.28348	417	.07237	5.4	.0284	
2.135	4.16949	429	4.28765	417	0.97242	5.4	1.0284	0.6
.136	.17369	429	.28982	417	.07248	5.4	.0283	
.137	.17798	430	.29399	418	.07253	5.4	.0282	
.138	.18228	430	.29817	418	.07258	5.4	.0282	
.139	.18658	430	.30235	419	.07264	5.4	.0281	
2.140	4.19089	431	4.30685	419	0.97269	5.4	1.0281	0.6
.141	.19520	431	.31124	420	.07275	5.4	.0280	
.142	.19952	432	.31564	420	.07280	5.4	.0280	
.143	.20384	432	.32004	420	.07285	5.4	.0279	
.144	.20816	433	.32434	421	.07291	5.3	.0278	
2.145	4.21339	433	4.32055	421	0.97296	5.3	1.0278	0.6
.146	.21682	433	.32877	422	.07301	5.3	.0277	
.147	.22115	434	.33309	422	.07307	5.3	.0277	
.148	.22549	434	.33741	423	.07312	5.3	.0276	
.149	.22984	435	.34164	423	.07317	5.3	.0276	
2.150	4.23419	435	4.35067	423	0.97323	5.3	1.0275	0.6
x	$\tanh x$	$= F_1'$	$\coth x$	$= F_2'$	$\sinh x$	$= F_3'$	$\cosh x$	$= F_4'$

Natural Hyperbolic Functions.

x	$\sinh x$	$= F_1'$	$\cosh x$	$= F_2'$	$\tanh x$	$= F_3'$	$\coth x$	$= F_4'$
2.150	4.43119	4.35	4.45909	4.43	0.97333	5.3	1.0275	0.6
151	4.43551	4.35	4.46341	4.43	0.97338	5.3	1.0275	
152	4.43983	4.35	4.46773	4.43	0.97343	5.3	1.0275	
153	4.44415	4.35	4.47205	4.43	0.97348	5.3	1.0275	
154	4.44847	4.37	4.47637	4.45	0.97353	5.2	1.0275	
2.155	4.45279	4.37	4.48069	4.45	0.97358	5.2	1.0275	0.6
156	4.45711	4.38	4.48501	4.46	0.97363	5.2	1.0275	0.6
157	4.46143	4.38	4.48933	4.46	0.97368	5.2	1.0275	0.5
158	4.46575	4.38	4.49365	4.47	0.97373	5.2	1.0275	0.5
159	4.47007	4.39	4.49797	4.47	0.97378	5.2	1.0275	0.5
2.160	4.47439	4.39	4.50229	4.48	0.97383	5.2	1.0275	0.5
161	4.47871	4.40	4.50661	4.48	0.97388	5.2	1.0275	
162	4.48303	4.40	4.51093	4.49	0.97393	5.2	1.0275	
163	4.48735	4.41	4.51525	4.49	0.97398	5.2	1.0275	
164	4.49167	4.41	4.51957	4.50	0.97403	5.1	1.0275	
2.165	4.49599	4.41	4.52389	4.50	0.97408	5.1	1.0275	0.5
166	4.50031	4.42	4.52821	4.50	0.97413	5.1	1.0275	
167	4.50463	4.42	4.53253	4.51	0.97418	5.1	1.0275	
168	4.50895	4.43	4.53685	4.51	0.97423	5.1	1.0275	
169	4.51327	4.43	4.54117	4.52	0.97428	5.1	1.0275	
2.170	4.51759	4.44	4.54549	4.52	0.97433	5.1	1.0275	0.5
171	4.52191	4.44	4.54981	4.53	0.97438	5.1	1.0275	
172	4.52623	4.44	4.55413	4.53	0.97443	5.1	1.0275	
173	4.53055	4.45	4.55845	4.54	0.97448	5.1	1.0275	
174	4.53487	4.45	4.56277	4.54	0.97453	5.0	1.0275	
2.175	4.53919	4.46	4.56709	4.54	0.97458	5.0	1.0275	0.5
176	4.54351	4.46	4.57141	4.55	0.97463	5.0	1.0275	
177	4.54783	4.47	4.57573	4.55	0.97468	5.0	1.0275	
178	4.55215	4.47	4.58005	4.56	0.97473	5.0	1.0275	
179	4.55647	4.48	4.58437	4.56	0.97478	5.0	1.0275	
2.180	4.56079	4.48	4.58869	4.57	0.97483	5.0	1.0275	0.5
181	4.56511	4.48	4.59301	4.57	0.97488	5.0	1.0275	
182	4.56943	4.49	4.59733	4.58	0.97493	5.0	1.0275	
183	4.57375	4.49	4.60165	4.58	0.97498	5.0	1.0275	
184	4.57807	4.50	4.60597	4.58	0.97503	4.9	1.0275	
2.185	4.58239	4.50	4.61029	4.59	0.97508	4.9	1.0275	0.5
186	4.58671	4.51	4.61461	4.59	0.97513	4.9	1.0275	
187	4.59103	4.51	4.61893	4.60	0.97518	4.9	1.0275	
188	4.59535	4.51	4.62325	4.60	0.97523	4.9	1.0275	
189	4.59967	4.52	4.62757	4.61	0.97528	4.9	1.0275	
2.190	4.60399	4.52	4.63189	4.61	0.97533	4.9	1.0275	0.5
191	4.60831	4.53	4.63621	4.62	0.97538	4.9	1.0275	
192	4.61263	4.53	4.64053	4.62	0.97543	4.9	1.0275	
193	4.61695	4.54	4.64485	4.63	0.97548	4.9	1.0275	
194	4.62127	4.54	4.64917	4.63	0.97553	4.8	1.0275	
2.195	4.62559	4.55	4.65349	4.63	0.97558	4.8	1.0275	0.5
196	4.62991	4.55	4.65781	4.64	0.97563	4.8	1.0275	
197	4.63423	4.55	4.66213	4.64	0.97568	4.8	1.0275	
198	4.63855	4.56	4.66645	4.65	0.97573	4.8	1.0275	
199	4.64287	4.56	4.67077	4.65	0.97578	4.8	1.0275	
2.200	4.64719	4.57	4.67509	4.66	0.97583	4.8	1.0275	0.5
x	$\sinh x$	$= F_1'$	$\cosh x$	$= F_2'$	$\tanh x$	$= F_3'$	$\coth x$	$= F_4'$

Natural Hyperbolic Functions.

x	$\sinh x$	$= F_1'$	$\cosh x$	$= F_2'$	$\tanh x$	$= F_3'$	$\coth x$	$= F_4'$
2.200	4.45711	457	4.56791	466	0.97574	4.8	1.0249	0.5
.201	.46168	457	.57237	466	.97579	4.8	.0248	
.202	.46625	458	.57694	467	.97581	4.8	.0248	
.203	.47083	458	.58150	467	.97586	4.8	.0247	
.204	.47541	459	.58607	468	.97593	4.8	.0247	
2.205	4.48000	459	4.59025	468	0.97598	4.7	1.0246	0.5
.206	.48459	459	.59483	468	.97603	4.7	.0246	
.207	.48919	460	.59942	469	.97608	4.7	.0245	
.208	.49379	460	.60401	469	.97612	4.7	.0245	
.209	.49840	461	.60861	470	.97617	4.7	.0244	
2.210	4.50301	461	4.61271	470	0.97622	4.7	1.0244	0.5
.211	.50762	462	.61724	471	.97626	4.7	.0243	
.212	.51224	462	.62172	471	.97631	4.7	.0243	
.213	.51687	463	.62624	472	.97636	4.7	.0242	
.214	.52149	463	.63080	472	.97640	4.7	.0242	
2.215	4.52613	464	4.63528	473	0.97645	4.7	1.0241	0.5
.216	.53077	464	.63981	473	.97650	4.6	.0241	
.217	.53541	464	.64431	474	.97654	4.6	.0240	
.218	.54005	465	.64888	474	.97659	4.6	.0240	
.219	.54471	465	.65342	474	.97664	4.6	.0239	
2.220	4.54935	466	4.65797	475	0.97668	4.6	1.0239	0.5
.221	.55402	466	.66252	475	.97673	4.6	.0238	
.222	.55869	467	.66708	476	.97678	4.6	.0238	
.223	.56336	467	.67164	476	.97682	4.6	.0237	
.224	.56803	468	.67620	477	.97687	4.6	.0237	
2.225	4.57271	468	4.68078	477	0.97691	4.6	1.0236	0.5
.226	.57739	469	.68535	478	.97696	4.6	.0236	
.227	.58208	469	.68993	478	.97700	4.5	.0235	
.228	.58677	469	.69451	479	.97705	4.5	.0235	
.229	.59147	470	.69910	479	.97709	4.5	.0234	
2.230	4.59617	470	4.70370	480	0.97714	4.5	1.0234	0.5
.231	.60087	471	.70830	480	.97718	4.5	.0233	
.232	.60559	471	.71290	481	.97723	4.5	.0233	
.233	.61030	472	.71751	481	.97727	4.5	.0233	
.234	.61502	472	.72212	482	.97732	4.5	.0232	
2.235	4.61974	473	4.72674	482	0.97736	4.5	1.0232	0.5
.236	.62447	473	.73135	482	.97741	4.5	.0231	
.237	.62919	474	.73599	483	.97745	4.5	.0231	
.238	.63395	474	.74062	483	.97750	4.4	.0230	
.239	.63869	475	.74525	484	.97754	4.4	.0230	
2.240	4.64344	475	4.74989	484	0.97759	4.4	1.0229	0.5
.241	.64819	475	.75451	485	.97763	4.4	.0229	
.242	.65295	476	.75910	485	.97768	4.4	.0228	
.243	.65771	476	.76376	486	.97772	4.4	.0228	
.244	.66247	477	.76831	486	.97776	4.4	.0227	
2.245	4.66721	477	4.77237	487	0.97781	4.4	1.0227	0.5
.246	.67202	478	.77691	487	.97785	4.4	.0227	
.247	.67680	478	.78152	488	.97790	4.4	.0226	
.248	.68158	479	.78610	488	.97794	4.4	.0226	
.249	.68637	479	.79068	489	.97798	4.4	.0225	
2.250	4.69117	480	4.79557	489	0.97803	4.3	1.0225	0.5
x	$\tanh x$	$= F_1'$	$\coth x$	$= F_2'$	$\sinh x$	$= F_3'$	$\cosh x$	$= F_4'$

SMITHSONIAN TABLES

Natural Hyperbolic Functions.

u	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$	$\operatorname{sech} u$	$\operatorname{csch} u$
2.250	4.69117	4.70157	0.99803	1.00205	0.00205	0.5
.251	4.69597	4.70636	0.99807	1.00204	0.00204	
.252	4.70077	4.71115	0.99811	1.00203	0.00203	
.253	4.70558	4.71594	0.99815	1.00202	0.00202	
.254	4.71039	4.72073	0.99819	1.00201	0.00201	0.5
2.255	4.71521	4.72552	0.99823	1.00200	0.00200	0.4
.256	4.72003	4.73031	0.99827	1.00199	0.00199	
.257	4.72485	4.73510	0.99831	1.00198	0.00198	
.258	4.72967	4.73989	0.99835	1.00197	0.00197	
.259	4.73449	4.74468	0.99839	1.00196	0.00196	
2.260	4.73931	4.74947	0.99843	1.00195	0.00195	0.4
.261	4.74413	4.75426	0.99847	1.00194	0.00194	
.262	4.74895	4.75905	0.99851	1.00193	0.00193	
.263	4.75377	4.76384	0.99855	1.00192	0.00192	
.264	4.75859	4.76863	0.99859	1.00191	0.00191	
2.265	4.76341	4.77342	0.99863	1.00190	0.00190	0.4
.266	4.76823	4.77821	0.99867	1.00189	0.00189	
.267	4.77305	4.78300	0.99871	1.00188	0.00188	
.268	4.77787	4.78779	0.99875	1.00187	0.00187	
.269	4.78269	4.79258	0.99879	1.00186	0.00186	
2.270	4.78751	4.79737	0.99883	1.00185	0.00185	0.4
.271	4.79233	4.80216	0.99887	1.00184	0.00184	
.272	4.79715	4.80695	0.99891	1.00183	0.00183	
.273	4.80197	4.81174	0.99895	1.00182	0.00182	
.274	4.80679	4.81653	0.99899	1.00181	0.00181	
2.275	4.81161	4.82132	0.99903	1.00180	0.00180	0.4
.276	4.81643	4.82611	0.99907	1.00179	0.00179	
.277	4.82125	4.83090	0.99911	1.00178	0.00178	
.278	4.82607	4.83569	0.99915	1.00177	0.00177	
.279	4.83089	4.84048	0.99919	1.00176	0.00176	
2.280	4.83571	4.84527	0.99923	1.00175	0.00175	0.4
.281	4.84053	4.85006	0.99927	1.00174	0.00174	
.282	4.84535	4.85485	0.99931	1.00173	0.00173	
.283	4.85017	4.85964	0.99935	1.00172	0.00172	
.284	4.85499	4.86443	0.99939	1.00171	0.00171	
2.285	4.85981	4.86922	0.99943	1.00170	0.00170	0.4
.286	4.86463	4.87401	0.99947	1.00169	0.00169	
.287	4.86945	4.87880	0.99951	1.00168	0.00168	
.288	4.87427	4.88359	0.99955	1.00167	0.00167	
.289	4.87909	4.88838	0.99959	1.00166	0.00166	
2.290	4.88391	4.89317	0.99963	1.00165	0.00165	0.4
.291	4.88873	4.89796	0.99967	1.00164	0.00164	
.292	4.89355	4.90275	0.99971	1.00163	0.00163	
.293	4.89837	4.90754	0.99975	1.00162	0.00162	
.294	4.90319	4.91233	0.99979	1.00161	0.00161	
2.295	4.90801	4.91712	0.99983	1.00160	0.00160	0.4
.296	4.91283	4.92191	0.99987	1.00159	0.00159	
.297	4.91765	4.92670	0.99991	1.00158	0.00158	
.298	4.92247	4.93149	0.99995	1.00157	0.00157	
.299	4.92729	4.93628	0.99999	1.00156	0.00156	
2.300	4.93211	4.94107	1.00000	1.00155	0.00155	0.4
u	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$	$\operatorname{sech} u$	$\operatorname{csch} u$

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
2.300	4.03696	504	5.03722	494	0.98010	3.0	1.0203	0.4
.301	.04200	505	.04216	494	.98014	3.0	.0203	
.302	.04295	505	.04310	495	.98018	3.0	.0202	
.303	.04310	505	.04305	495	.98021	3.0	.0202	
.304	.04315	506	.04301	495	.98025	3.0	.0201	
2.305	4.06221	506	5.06197	496	0.98029	3.0	1.0201	0.4
.306	.06227	507	.06203	497	.98033	3.0	.0201	
.307	.07234	507	.07190	497	.98037	3.0	.0200	
.308	.07744	508	.07688	498	.98041	3.0	.0200	
.309	.08259	508	.08185	498	.98045	3.0	.0199	
2.310	4.08752	509	5.08684	499	0.98049	3.0	1.0199	0.4
.311	.08267	509	.08183	499	.98053	3.0	.0199	
.312	.09277	510	.09183	500	.98056	3.0	.0198	
.313	.10286	510	.10183	500	.98060	3.0	.0198	
.314	.09797	511	.10683	501	.98064	3.0	.0197	
2.315	5.01308	511	5.11181	501	0.98068	3.0	1.0197	0.4
.316	.01839	512	.11685	502	.98072	3.0	.0197	
.317	.02331	512	.12188	502	.98076	3.0	.0196	
.318	.02844	513	.12691	503	.98079	3.0	.0196	
.319	.03357	513	.13194	503	.98083	3.0	.0195	
2.320	5.03879	514	5.13697	504	0.98087	3.0	1.0195	0.4
.321	.04381	514	.14202	504	.98091	3.0	.0195	
.322	.04889	515	.14705	505	.98095	3.0	.0194	
.323	.05413	515	.15211	505	.98098	3.0	.0194	
.324	.05929	516	.15717	505	.98102	3.0	.0193	
2.325	5.06445	516	5.16223	506	0.98106	3.0	1.0193	0.4
.326	.06961	517	.16730	507	.98110	3.0	.0193	
.327	.07478	517	.17237	507	.98113	3.0	.0192	
.328	.07996	518	.17745	508	.98117	3.0	.0192	
.329	.08514	518	.18253	509	.98121	3.0	.0192	
2.330	5.09032	519	5.18762	509	0.98125	3.0	1.0191	0.4
.331	.09551	519	.19271	510	.98128	3.0	.0191	
.332	.10071	520	.19781	510	.98132	3.0	.0190	
.333	.10591	520	.20291	511	.98136	3.0	.0190	
.334	.11111	521	.20802	511	.98140	3.0	.0190	
2.335	5.11632	521	5.21314	512	0.98143	3.0	1.0189	0.4
.336	.12154	522	.21825	512	.98147	3.0	.0189	
.337	.12676	522	.22338	513	.98150	3.0	.0188	
.338	.13199	523	.22851	513	.98154	3.0	.0188	
.339	.13722	523	.23364	514	.98158	3.0	.0188	
2.340	5.14245	524	5.23878	514	0.98161	3.0	1.0187	0.4
.341	.14770	524	.24393	515	.98165	3.0	.0187	
.342	.15294	525	.24908	515	.98169	3.0	.0187	
.343	.15819	525	.25423	516	.98172	3.0	.0186	
.344	.16345	526	.25939	516	.98176	3.0	.0186	
2.345	5.16871	526	5.26496	517	0.98179	3.0	1.0185	0.4
.346	.17398	527	.26023	517	.98183	3.0	.0185	
.347	.17925	527	.26549	518	.98187	3.0	.0185	
.348	.18453	528	.27076	518	.98190	3.0	.0184	
.349	.18981	529	.27603	519	.98194	3.0	.0184	
2.350	5.19510	529	5.29047	520	0.98197	3.0	1.0184	0.4
u	tanh u	= F ₁ '	coth u	= F ₂ '	sinh u	= F ₃ '	cosh u	= F ₄ '

SMITHSONIAN TABLES

Natural Hyperbolic Functions.

n	sinh n	= F'	cosh n	= F'	sinh n	= F'	cosh n	= F'
2.49	5.49510	5.49	5.49347	5.49	0.98107	3.5	1.0181	0.4
.491	.49039	5.49	.49197	5.49	.98204	3.5	.0183	
.492	.49169	5.49	.49287	5.49	.98291	3.5	.0185	
.493	.49299	5.49	.49376	5.49	.98378	3.5	.0187	
.494	.49429	5.49	.49465	5.49	.98465	3.5	.0189	
2.50	5.50162	5.50	5.50151	5.50	0.98462	3.5	1.0182	0.4
.501	.50091	5.50	.50174	5.50	.98549	3.5	.0184	
.502	.50220	5.50	.50307	5.50	.98636	3.5	.0186	
.503	.50350	5.50	.50437	5.50	.98723	3.5	.0188	
.504	.50480	5.50	.50567	5.50	.98810	3.5	.0190	
2.51	5.51457	5.51	5.51449	5.51	0.98807	3.5	1.0180	0.4
.511	.51386	5.51	.51474	5.51	.98894	3.5	.0182	
.512	.51516	5.51	.51603	5.51	.98981	3.5	.0184	
.513	.51646	5.51	.51733	5.51	.99068	3.5	.0186	
.514	.51776	5.51	.51863	5.51	.99155	3.5	.0188	
2.52	5.52704	5.52	5.52696	5.52	0.99152	3.5	1.0178	0.4
.521	.52633	5.52	.52720	5.52	.99239	3.5	.0180	
.522	.52763	5.52	.52850	5.52	.99326	3.5	.0182	
.523	.52893	5.52	.52980	5.52	.99413	3.5	.0184	
.524	.53023	5.52	.53110	5.52	.99500	3.5	.0186	
2.53	5.53951	5.53	5.53943	5.53	0.99497	3.5	1.0176	0.4
.531	.53920	5.53	.54007	5.53	.99584	3.5	.0178	
.532	.54050	5.53	.54137	5.53	.99671	3.5	.0180	
.533	.54180	5.53	.54267	5.53	.99758	3.5	.0182	
.534	.54310	5.53	.54397	5.53	.99845	3.5	.0184	
2.54	5.55000	5.54	5.54992	5.54	0.99842	3.5	1.0174	0.4
.541	.55069	5.54	.55156	5.54	.99929	3.5	.0176	
.542	.55199	5.54	.55286	5.54	.99916	3.5	.0178	
.543	.55329	5.54	.55416	5.54	.99903	3.5	.0180	
.544	.55459	5.54	.55546	5.54	.99990	3.5	.0182	
2.55	5.56048	5.55	5.56040	5.55	0.99987	3.5	1.0172	0.4
.551	.56017	5.55	.56104	5.55	.99974	3.5	.0174	
.552	.56147	5.55	.56234	5.55	.99961	3.5	.0176	
.553	.56277	5.55	.56364	5.55	.99948	3.5	.0178	
.554	.56407	5.55	.56494	5.55	.99935	3.5	.0180	
2.56	5.57137	5.56	5.57129	5.56	0.99932	3.5	1.0170	0.4
.561	.57106	5.56	.57193	5.56	.99919	3.5	.0172	
.562	.57236	5.56	.57323	5.56	.99906	3.5	.0174	
.563	.57366	5.56	.57453	5.56	.99893	3.5	.0176	
.564	.57496	5.56	.57583	5.56	.99880	3.5	.0178	
2.57	5.58227	5.57	5.58219	5.57	0.99877	3.5	1.0168	0.4
.571	.58196	5.57	.58283	5.57	.99864	3.5	.0170	
.572	.58326	5.57	.58413	5.57	.99851	3.5	.0172	
.573	.58456	5.57	.58543	5.57	.99838	3.5	.0174	
.574	.58586	5.57	.58673	5.57	.99825	3.5	.0176	
2.58	5.59318	5.58	5.59310	5.58	0.99822	3.5	1.0166	0.4
.581	.59287	5.58	.59374	5.58	.99809	3.5	.0168	
.582	.59417	5.58	.59504	5.58	.99796	3.5	.0170	
.583	.59547	5.58	.59634	5.58	.99783	3.5	.0172	
.584	.59677	5.58	.59764	5.58	.99770	3.5	.0174	
2.59	5.60369	5.59	5.60361	5.59	0.99767	3.5	1.0164	0.4
.591	.60338	5.59	.60425	5.59	.99754	3.5	.0166	
.592	.60468	5.59	.60555	5.59	.99741	3.5	.0168	
.593	.60598	5.59	.60685	5.59	.99728	3.5	.0170	
.594	.60728	5.59	.60815	5.59	.99715	3.5	.0172	
2.60	5.61420	5.60	5.61412	5.60	0.99712	3.5	1.0162	0.4
.601	.61389	5.60	.61476	5.60	.99699	3.5	.0164	
.602	.61519	5.60	.61606	5.60	.99686	3.5	.0166	
.603	.61649	5.60	.61736	5.60	.99673	3.5	.0168	
.604	.61779	5.60	.61866	5.60	.99660	3.5	.0170	
2.61	5.62511	5.61	5.62503	5.61	0.99657	3.5	1.0160	0.4
.611	.62480	5.61	.62567	5.61	.99644	3.5	.0162	
.612	.62610	5.61	.62697	5.61	.99631	3.5	.0164	
.613	.62740	5.61	.62827	5.61	.99618	3.5	.0166	
.614	.62870	5.61	.62957	5.61	.99605	3.5	.0168	
2.62	5.63562	5.62	5.63554	5.62	0.99602	3.5	1.0158	0.4
.621	.63531	5.62	.63618	5.62	.99589	3.5	.0160	
.622	.63661	5.62	.63748	5.62	.99576	3.5	.0162	
.623	.63791	5.62	.63878	5.62	.99563	3.5	.0164	
.624	.63921	5.62	.64008	5.62	.99550	3.5	.0166	
2.63	5.64613	5.63	5.64605	5.63	0.99547	3.5	1.0156	0.4
.631	.64582	5.63	.64669	5.63	.99534	3.5	.0158	
.632	.64712	5.63	.64799	5.63	.99521	3.5	.0160	
.633	.64842	5.63	.64929	5.63	.99508	3.5	.0162	
.634	.64972	5.63	.65059	5.63	.99495	3.5	.0164	
2.64	5.65665	5.64	5.65657	5.64	0.99492	3.5	1.0154	0.4
.641	.65634	5.64	.65721	5.64	.99479	3.5	.0156	
.642	.65764	5.64	.65851	5.64	.99466	3.5	.0158	
.643	.65894	5.64	.65981	5.64	.99453	3.5	.0160	
.644	.66024	5.64	.66111	5.64	.99440	3.5	.0162	
2.65	5.66717	5.65	5.66709	5.65	0.99437	3.5	1.0152	0.4
.651	.66686	5.65	.66773	5.65	.99424	3.5	.0154	
.652	.66816	5.65	.66903	5.65	.99411	3.5	.0156	
.653	.66946	5.65	.67033	5.65	.99398	3.5	.0158	
.654	.67076	5.65	.67163	5.65	.99385	3.5	.0160	
2.66	5.67769	5.66	5.67761	5.66	0.99382	3.5	1.0150	0.4
.661	.67738	5.66	.67825	5.66	.99369	3.5	.0152	
.662	.67868	5.66	.67955	5.66	.99356	3.5	.0154	
.663	.67998	5.66	.68085	5.66	.99343	3.5	.0156	
.664	.68128	5.66	.68215	5.66	.99330	3.5	.0158	
2.67	5.68862	5.67	5.68854	5.67	0.99327	3.5	1.0148	0.4
.671	.68831	5.67	.68918	5.67	.99314	3.5	.0150	
.672	.68961	5.67	.69048	5.67	.99301	3.5	.0152	
.673	.69091	5.67	.69178	5.67	.99288	3.5	.0154	
.674	.69221	5.67	.69308	5.67	.99275	3.5	.0156	
2.68	5.69955	5.68	5.69947	5.68	0.99272	3.5	1.0146	0.4
.681	.69924	5.68	.70011	5.68	.99259	3.5	.0148	
.682	.70054	5.68	.70141	5.68	.99246	3.5	.0150	
.683	.70184	5.68	.70271	5.68	.99233	3.5	.0152	
.684	.70314	5.68	.70401	5.68	.99220	3.5	.0154	
2.69	5.71048	5.69	5.71040	5.69	0.99217	3.5	1.0144	0.4
.691	.71017	5.69	.71104	5.69	.99204	3.5	.0146	
.692	.71147	5.69	.71234	5.69	.99191	3.5	.0148	
.693	.71277	5.69	.71364	5.69	.99178	3.5	.0150	
.694	.71407	5.69	.71494	5.69	.99165	3.5	.0152	
2.70	5.72141	5.70	5.72133	5.70	0.99162	3.5	1.0142	0.4
.701	.72110	5.70	.72197	5.70	.99149	3.5	.0144	
.702	.72240	5.70	.72327	5.70	.99136	3.5	.0146	
.703	.72370	5.70	.72457	5.70	.99123	3.5	.0148	
.704	.72500	5.70	.72587	5.70	.99110	3.5	.0150	
2.71	5.73235	5.71	5.73227	5.71	0.99107	3.5	1.0140	0.4
.711	.73204	5.71	.73291	5.71	.99094	3.5	.0142	
.712	.73334	5.71	.73421	5.71	.99081	3.5	.0144	
.713	.73464	5.71	.73551	5.71	.99068	3.5	.0146	
.714	.73594	5.71	.73681	5.71	.99055	3.5	.0148	
2.72	5.74329	5.72	5.74321	5.72	0.99052	3.5	1.0138	0.4
.721	.74298	5.72	.74385	5.72	.99039	3.5	.0140	
.722	.74428	5.72	.74515	5.72	.99026	3.5	.0142	
.723	.74558	5.72	.74645	5.72	.99013	3.5	.0144	
.724	.74688	5.72	.74775	5.72	.99000	3.5	.0146	
2.73	5.75423	5.73	5.75415	5.73	0.99000	3.5	1.0136	0.4
.731	.75392	5.73	.75479	5.73	.98987	3.5	.0138	
.732	.75522	5.73	.75609	5.73	.98974	3.5	.0140	
.733	.75652	5.73	.75739	5.73	.98961	3.5	.0142	
.734	.75782	5.73	.75869	5.73	.98948	3.5	.0144	
2.74	5.76517	5.74	5.76509	5.74	0.98945	3.5	1.0134	0.4
.741	.76486	5.74	.76573	5.74	.98932	3.5	.0136	
.742	.76616	5.74	.76703	5.74	.98919	3.5	.0138	
.743	.76746	5.74	.76833	5.74	.98906	3.5	.0140	
.744	.76876	5.74	.76963	5.74	.98893	3.5	.0142	
2.75	5.77611	5.75	5.77603	5.75	0.98890	3.5	1.0132	0.4
.751	.77580	5.75	.77667	5.75	.98877	3.5	.0134	
.752	.77710	5.75	.77797	5.75	.98864	3.5	.0136	
.753	.77840	5.75	.77927	5.75	.98851	3.5	.0138	
.754	.77970	5.75	.78057	5.75	.98838	3.5	.0140	
2.76	5.78705	5.76	5.78697	5.76	0.98835	3.5	1.0130	0.4
.761	.78674	5.76	.78761	5.76	.98822	3.5	.0132	
.762	.78804	5.76	.78891	5.76	.98809	3.5	.0134	
.763	.78934	5.76	.79021	5.76	.98796	3.5	.0136	
.764	.79064	5.76	.79151	5.76	.98783	3.5	.0138	
2.77	5.79799	5.77	5.79791	5.77	0.98780	3.5	1.0128	0.4
.771	.79768	5.77	.79855	5.77	.98767	3.5	.0130	
.772	.79898	5.77	.79985	5.77	.98754	3.5	.0132	

Natural Hyperbolic Functions.

u	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$
2.400	5.46623	595	5.55905	547	0.08199	2.2	1.0166	0.3
.401	.67179	599	.91444	547	.08199	2.2	.0166	
.402	.67715	557	.91979	548	.08199	2.2	.0166	
.403	.68252	557	.92517	548	.08199	2.2	.0166	
.404	.68890	558	.93056	549	.08199	2.2	.0166	
2.405	5.49108	558	5.58115	549	0.08199	2.2	1.0166	0.3
.406	.69657	559	.93601	550	.08199	2.2	.0166	
.407	.70201	560	.94135	551	.08199	2.2	.0166	
.408	.70745	560	.94669	551	.08199	2.2	.0166	
.409	.71289	561	.95203	552	.08199	2.2	.0166	
2.410	5.52207	561	5.61189	552	0.08199	2.2	1.0166	0.3
.411	.71799	562	.95741	553	.08199	2.2	.0166	
.412	.72331	562	.96276	553	.08199	2.2	.0166	
.413	.72863	563	.96810	554	.08199	2.2	.0166	
.414	.73400	563	.97345	554	.08199	2.2	.0166	
2.415	5.55300	564	5.64267	555	0.08199	2.2	1.0166	0.3
.416	.73934	565	.97881	556	.08199	2.2	.0166	
.417	.74470	565	.98415	556	.08199	2.2	.0166	
.418	.75005	566	.98949	557	.08199	2.2	.0166	
.419	.75540	566	.99483	557	.08199	2.2	.0166	
2.420	5.58397	567	5.67339	558	0.08199	2.2	1.0166	0.3
.421	.76074	567	.99999	558	.08199	2.2	.0166	
.422	.76610	568	.00534	559	.08199	2.2	.0166	
.423	.77145	568	.01068	560	.08199	2.2	.0166	
.424	.77680	569	.01602	560	.08199	2.2	.0166	
2.425	5.61488	570	5.70431	561	0.08199	2.2	1.0166	0.3
.426	.78215	570	.02136	561	.08199	2.2	.0166	
.427	.78750	571	.02670	562	.08199	2.2	.0166	
.428	.79285	571	.03204	562	.08199	2.2	.0166	
.429	.79820	572	.03738	563	.08199	2.2	.0166	
2.430	5.64582	572	5.73476	564	0.08199	2.2	1.0166	0.3
.431	.80357	573	.04272	564	.08199	2.2	.0166	
.432	.80892	573	.04806	565	.08199	2.2	.0166	
.433	.81426	574	.05340	565	.08199	2.2	.0166	
.434	.81960	575	.05874	566	.08199	2.2	.0166	
2.435	5.67677	575	5.76517	566	0.08199	2.2	1.0166	0.3
.436	.82495	576	.06408	567	.08199	2.2	.0166	
.437	.83030	576	.06942	568	.08199	2.2	.0166	
.438	.83564	577	.07476	568	.08199	2.2	.0166	
.439	.84098	577	.08010	569	.08199	2.2	.0166	
2.440	5.70784	578	5.79560	570	0.08199	2.2	1.0166	0.3
.441	.84632	579	.08544	570	.08199	2.2	.0166	
.442	.85166	579	.09078	571	.08199	2.2	.0166	
.443	.85700	580	.09612	571	.08199	2.2	.0166	
.444	.86234	580	.10146	572	.08199	2.2	.0166	
2.445	5.73879	581	5.82601	572	0.08199	2.2	1.0166	0.3
.446	.86768	581	.10680	573	.08199	2.2	.0166	
.447	.87302	582	.11214	573	.08199	2.2	.0166	
.448	.87836	583	.11748	574	.08199	2.2	.0166	
.449	.88370	583	.12282	575	.08199	2.2	.0166	
2.450	5.77073	584	5.85673	575	0.08199	2.2	1.0166	0.3
u	$\tanh u$	$\coth u$	$\sinh u$	$\cosh u$	$\sinh u$	$\cosh u$	$\tanh u$	$\coth u$

Natural Hyperbolic Functions.

u	sinh u	u F'	cosh u	u F'	tanh u	u F'	cosh u	u F'
2.450	5.75103	581	5.813733	578	0.68522	2.0	1.0159	0.3
.451	.75187	584	.81407	579	.68525	2.0	.0159	
.452	.75271	585	.81483	576	.68528	2.0	.0159	
.453	.75356	588	.81560	577	.68531	2.0	.0159	
.454	.75442	589	.81637	577	.68533	2.0	.0159	
2.455	5.75629	597	5.81615	578	0.68536	2.0	1.0159	0.3
.456	.75615	597	.81693	579	.68539	2.0	.0158	
.457	.75693	598	.81772	579	.68542	2.0	.0158	
.458	.75771	598	.81852	580	.68545	2.0	.0158	
.459	.75850	599	.81932	580	.68548	2.0	.0157	
2.460	5.76036	600	5.81912	581	0.68551	2.0	1.0157	0.3
.461	.76159	600	.82004	582	.68554	2.0	.0157	
.462	.76240	601	.82075	582	.68557	2.0	.0156	
.463	.76320	601	.82158	583	.68560	2.0	.0156	
.464	.76402	602	.82241	583	.68562	2.0	.0156	
2.465	5.76224	603	5.82125	581	0.68565	2.0	1.0156	0.3
.466	.76516	603	.82309	585	.68568	2.0	.0155	
.467	.76598	604	.82394	585	.68571	2.0	.0155	
.468	.76680	604	.82479	586	.68574	2.0	.0155	
.469	.76763	605	.82565	586	.68577	2.0	.0154	
2.470	5.76443	605	5.82552	587	0.68579	2.0	1.0154	0.3
.471	.76789	606	.82639	587	.68582	2.0	.0154	
.472	.76865	607	.82727	588	.68585	2.0	.0154	
.473	.76942	607	.82815	589	.68588	2.0	.0153	
.474	.77020	608	.82904	589	.68590	2.0	.0153	
2.475	5.76877	608	5.82894	590	0.68593	2.0	1.0153	0.3
.476	.77070	609	.82983	591	.68597	2.0	.0153	
.477	.77153	609	.83073	591	.68600	2.0	.0152	
.478	.77235	609	.83164	592	.68602	2.0	.0152	
.479	.77317	601	.83255	592	.68605	2.0	.0152	
2.480	5.77076	601	5.83250	593	0.68607	2.0	1.0151	0.3
.481	.77378	602	.83341	593	.68610	2.0	.0151	
.482	.77460	602	.83432	594	.68613	2.0	.0151	
.483	.77542	603	.83522	595	.68615	2.0	.0150	
.484	.77625	604	.83612	595	.68618	2.0	.0150	
2.485	5.77390	604	5.83622	596	0.68621	2.0	1.0150	0.3
.486	.77694	605	.83718	596	.68624	2.0	.0150	
.487	.77779	605	.83815	597	.68626	2.0	.0150	
.488	.77865	606	.83913	598	.68629	2.0	.0150	
.489	.77951	607	.84011	598	.68632	2.0	.0150	
2.490	5.77618	607	5.83720	599	0.68635	2.0	1.0150	0.3
.491	.78026	608	.84090	600	.68637	2.0	.0150	
.492	.78114	608	.84181	600	.68640	2.0	.0150	
.493	.78203	609	.84272	601	.68643	2.0	.0150	
.494	.78292	610	.84363	601	.68645	2.0	.0150	
2.495	5.78092	610	5.84021	602	0.68648	2.0	1.0150	0.3
.496	.78457	611	.84514	603	.68651	2.0	.0150	
.497	.78545	611	.84607	603	.68653	2.0	.0150	
.498	.78635	612	.84700	604	.68656	2.0	.0150	
.499	.78725	613	.84794	604	.68659	2.0	.0150	
2.500	5.78500	613	5.84729	605	0.68661	2.0	1.0150	0.3
u	tanh u	u F'	sec sh u	u F'	sinh u	u F'	csh u	u F'

Natural Hyperbolic Functions.

x	$\sinh x$	$= F_1'$	$\cosh x$	$= F_2'$	$\tanh x$	$= F_3'$	$\coth x$	$= F_4'$
2.500	6.05020	613	6.13229	605	0.08061	2.7	1.0130	0.3
.501	.08061	614	1.38311	606	.08061	2.7	.0135	
.502	.08128	614	1.41490	606	.08067	2.7	.0135	
.503	.08195	615	1.45037	607	.08069	2.6	.0135	
.504	.07278	616	1.49051	607	.08072	2.6	.0135	
2.505	6.08091	616	6.16362	608	0.08075	2.6	1.0131	0.3
.506	.08111	617	1.4870	608	.08077	2.6	.0131	
.507	.08128	617	1.47470	609	.08080	2.6	.0131	
.508	.08090	618	1.46460	610	.08081	2.6	.0131	
.509	.08051	619	1.45699	611	.08085	2.6	.0131	
2.510	6.11185	619	6.20310	611	0.08088	2.6	1.0133	0.3
.511	1.08015	620	1.49021	612	.08090	2.6	.0133	
.512	1.12123	621	1.48534	612	.08091	2.6	.0133	
.513	1.16341	621	1.47440	613	.08090	2.6	.0133	
.514	1.2065	622	1.4760	613	.08098	2.6	.0133	
2.515	6.14387	622	6.23371	613	0.08091	2.6	1.0132	0.3
.516	1.19109	623	1.45988	615	.08091	2.6	.0131	
.517	1.23533	624	1.45611	616	.08090	2.6	.0131	
.518	1.28157	624	1.44219	616	.08098	2.6	.0131	
.519	1.32982	625	1.4899	617	.08091	2.6	.0131	
2.520	6.17407	625	6.25153	617	0.08094	2.6	1.0130	0.3
.521	1.38033	626	1.46710	618	.08090	2.6	.0130	
.522	1.43099	627	1.46060	619	.08090	2.5	.0130	
.523	1.48286	627	1.45088	619	.08091	2.5	.0130	
.524	1.53594	628	1.47027	620	.08091	2.5	.0130	
2.525	6.20532	629	6.28518	621	0.08092	2.5	1.0129	0.3
.526	1.51771	629	1.49169	621	.08092	2.5	.0129	
.527	1.57009	630	1.49000	622	.08091	2.5	.0128	
.528	1.62430	630	1.49112	622	.08091	2.5	.0128	
.529	1.67961	631	1.49035	623	.08090	2.5	.0128	
2.530	6.23602	632	6.31694	623	0.08093	2.5	1.0128	0.3
.531	1.63224	632	1.4880	624	.08091	2.5	.0127	
.532	1.68697	633	1.49097	625	.08091	2.5	.0127	
.533	1.74300	634	1.48512	626	.08090	2.5	.0127	
.534	1.80024	634	1.48158	626	.08090	2.5	.0127	
2.535	6.26898	635	6.34788	627	0.08095	2.5	1.0126	0.3
.536	1.75601	635	1.48112	627	.08095	2.5	.0126	
.537	1.81421	636	1.48010	628	.08090	2.5	.0126	
.538	1.87366	637	1.48068	629	.08090	2.5	.0126	
.539	1.93403	637	1.47937	629	.08091	2.5	.0126	
2.540	6.30040	638	6.37917	630	0.08096	2.5	1.0125	0.3
.541	1.90728	639	1.48053	631	.08096	2.5	.0125	0.3
.542	1.96517	640	1.48088	631	.08096	2.4	.0125	0.3
.543	1.99507	640	1.48020	632	.08097	2.4	.0125	0.3
.544	1.99907	640	1.48052	633	.08097	2.4	.0125	0.2
2.545	6.33238	641	6.41068	633	0.08096	2.4	1.0124	0.2
.546	1.98779	642	1.47119	634	.08097	2.4	.0124	
.547	1.98521	642	1.42551	635	.08096	2.4	.0123	
.548	1.98164	643	1.42688	635	.08093	2.4	.0123	
.549	1.98007	644	1.43623	636	.08090	2.4	.0123	
2.550	6.36451	644	6.44299	636	0.08098	2.4	1.0123	0.2
x	$\sinh x$	$= F_1'$	$\cosh x$	$= F_2'$	$\tanh x$	$= F_3'$	$\coth x$	$= F_4'$

Natural Hyperbolic Functions.

u	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$	$\tanh u$	$= F_3'$	$\coth u$	$= F_4'$
2.530	6.36451	644	6.44250	639	0.98788	2.4	1.0123	0.2
.551	.37096	645	.44866	639	.98790	2.4	.0122	
.552	.37741	646	.45533	638	.98793	2.4	.0122	
.553	.38387	646	.46172	638	.98795	2.4	.0122	
.554	.39033	647	.46810	639	.98798	2.4	.0122	
2.555	6.39686	647	6.47450	640	0.98800	2.4	1.0121	0.2
.556	.40328	648	.48009	640	.98802	2.4	.0121	
.557	.40977	649	.48730	641	.98805	2.4	.0121	
.558	.41626	649	.49372	642	.98807	2.4	.0121	
.559	.42275	650	.50014	642	.98810	2.4	.0120	
2.560	6.42026	651	6.50696	643	0.98812	2.4	1.0120	0.2
.561	.43577	651	.51209	644	.98814	2.4	.0120	
.562	.44228	652	.51943	644	.98817	2.4	.0120	
.563	.44880	653	.52588	645	.98819	2.3	.0120	
.564	.45533	653	.53233	646	.98821	2.3	.0119	
2.565	6.46187	654	6.53879	646	0.98824	2.3	1.0119	0.2
.566	.46841	655	.54525	647	.98826	2.3	.0119	
.567	.47496	655	.55173	647	.98828	2.3	.0119	
.568	.48152	656	.55820	648	.98831	2.3	.0118	
.569	.48808	656	.56469	649	.98833	2.3	.0118	
2.570	6.49964	657	6.57118	649	0.98835	2.3	1.0118	0.2
.571	.50422	658	.57768	650	.98838	2.3	.0118	
.572	.50980	658	.58418	651	.98840	2.3	.0117	
.573	.51539	659	.59059	651	.98842	2.3	.0117	
.574	.52098	660	.59701	652	.98845	2.3	.0117	
2.575	6.52758	660	6.60374	653	0.98847	2.3	1.0117	0.2
.576	.53419	661	.61027	653	.98849	2.3	.0116	
.577	.54080	662	.61680	654	.98851	2.3	.0116	
.578	.54742	662	.62335	655	.98853	2.3	.0116	
.579	.55405	663	.62990	655	.98856	2.3	.0116	
2.580	6.56068	664	6.63646	656	0.98858	2.3	1.0115	0.2
.581	.56732	664	.64302	657	.98860	2.3	.0115	
.582	.57397	665	.64959	657	.98863	2.3	.0115	
.583	.58062	666	.65617	658	.98865	2.3	.0115	
.584	.58728	666	.66275	659	.98867	2.3	.0115	
2.585	6.59335	667	6.66934	659	0.98870	2.2	1.0114	0.2
.586	.60002	668	.67594	660	.98872	2.2	.0114	
.587	.60670	668	.68254	661	.98874	2.2	.0114	
.588	.61328	669	.68915	661	.98876	2.2	.0114	
.589	.62008	670	.69577	662	.98878	2.2	.0113	
2.590	6.62738	670	6.70240	663	0.98881	2.2	1.0113	0.2
.591	.63408	671	.70903	663	.98883	2.2	.0113	
.592	.64079	672	.71566	664	.98885	2.2	.0113	
.593	.64751	672	.72231	665	.98887	2.2	.0113	
.594	.65424	673	.72896	665	.98890	2.2	.0112	
2.595	6.66007	674	6.73562	666	0.98892	2.2	1.0112	0.2
.596	.66771	674	.74228	667	.98894	2.2	.0112	
.597	.67446	675	.74895	667	.98896	2.2	.0112	
.598	.68121	676	.75563	668	.98898	2.2	.0111	
.599	.68797	676	.76231	669	.98901	2.2	.0111	
2.600	6.69473	677	6.76901	669	0.98903	2.2	1.0111	0.2
u	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$	$\tanh u$	$= F_3'$	$\coth u$	$= F_4'$

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
2.600	6.69473	677	6.76001	669	0.98003	2,2	1.0111	0,2
.601	.70150	678	.77570	670	.98005	2,2	.0111	
.602	.70288	678	.78241	671	.98007	2,2	.0110	
.603	.71507	679	.78912	672	.98009	2,2	.0110	
.604	.72186	680	.79584	672	.98011	2,2	.0110	
2.605	6.72866	680	6.80296	673	0.98014	2,2	1.0110	0,2
.606	.73547	681	.80030	674	.98016	2,2	.0110	
.607	.74228	682	.81604	674	.98018	2,2	.0109	
.608	.74910	682	.82276	675	.98020	2,1	.0109	
.609	.75593	683	.82953	676	.98022	2,1	.0109	
2.610	6.76276	684	6.83699	676	0.98024	2,1	1.0109	0,2
.611	.76960	684	.84366	677	.98026	2,1	.0109	
.612	.77644	685	.84983	678	.98029	2,1	.0108	
.613	.78330	686	.85661	678	.98031	2,1	.0108	
.614	.79016	686	.86340	679	.98033	2,1	.0108	
2.615	6.79702	687	6.87019	680	0.98035	2,1	1.0108	0,2
.616	.80390	688	.86999	680	.98037	2,1	.0107	
.617	.81078	688	.87580	681	.98039	2,1	.0107	
.618	.81767	689	.88261	682	.98041	2,1	.0107	
.619	.82456	690	.88944	682	.98043	2,1	.0107	
2.620	6.83146	690	6.90496	683	0.98046	2,1	1.0107	0,2
.621	.83837	691	.89119	684	.98048	2,1	.0106	
.622	.84528	692	.89794	685	.98050	2,1	.0106	
.623	.85220	692	.90479	685	.98052	2,1	.0106	
.624	.85913	693	.91164	686	.98054	2,1	.0106	
2.625	6.86607	694	6.93851	687	0.98056	2,1	1.0106	0,2
.626	.86791	695	.91538	687	.98058	2,1	.0105	
.627	.87490	695	.92225	688	.98060	2,1	.0105	
.628	.88191	696	.92914	689	.98062	2,1	.0105	
.629	.88888	697	.93603	689	.98064	2,1	.0105	
2.630	6.90085	697	6.97212	690	0.98066	2,1	1.0104	0,2
.631	.89782	698	.94283	691	.98068	2,1	.0104	
.632	.90481	699	.94974	691	.98070	2,0	.0104	
.633	.91180	699	.95666	692	.98072	2,0	.0104	
.634	.91879	700	.96358	693	.98074	2,0	.0104	
2.635	6.93580	701	7.00752	694	0.98077	2,0	1.0103	0,2
.636	.92281	701	.97046	694	.98079	2,0	.0103	
.637	.92983	702	.97740	695	.98081	2,0	.0103	
.638	.93685	703	.98435	696	.98083	2,0	.0103	
.639	.94388	704	.99132	696	.98085	2,0	.0103	
2.640	6.97092	704	7.04288	697	0.98087	2,0	1.0102	0,2
.641	.97797	705	.99836	698	.98089	2,0	.0102	
.642	.98502	706	.99524	699	.98091	2,0	.0102	
.643	.99208	706	.99213	699	.98093	2,0	.0102	
.644	.99915	707	.99922	700	.98095	2,0	.0102	
2.645	7.00622	708	7.07721	701	0.98097	2,0	1.0101	0,2
.646	.01330	708	.08421	701	.98099	2,0	.0101	
.647	.02039	709	.09125	702	.98101	2,0	.0101	
.648	.02748	710	.09828	703	.98103	2,0	.0101	
.649	.03458	711	.10531	703	.98105	2,0	.0101	
2.650	7.04169	711	7.11234	704	0.98107	2,0	1.0100	0,2
u	tan gd u	= F ₁ '	sec gd u	= F ₂ '	sin gd u	= F ₃ '	cos gd u	= F ₄ '

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
2.690	.761400	711	7.11231	704	0.107007	2.0	1.0000	0.2
.001	.000881	712	.11029	705	.000009	2.0	.0000	
.002	.001763	713	.12041	706	.000013	2.0	.0000	
.003	.002645	714	.13150	707	.000015	2.0	.0000	
.004	.003527	715	.14257	708	.000016	2.0	.0000	
2.695	.762773	715	7.12703	708	0.108016	2.0	1.0000	0.2
.000	.08140	715	.05472	708	.000018	2.0	.0000	
.002	.000805	716	.10080	709	.000020	1.9	.0000	
.004	.001612	717	.14691	710	.000022	1.9	.0000	
.006	.002419	718	.19301	711	.000024	1.9	.0000	
2.699	.764147	718	7.18312	714	0.109026	1.9	1.0000	0.2
.001	.13030	719	.10043	712	.000026	1.9	.0000	
.002	.12755	720	.10746	713	.000028	1.9	.0000	
.003	.13479	720	.10449	713	.000030	1.9	.0000	
.004	.14199	721	.10153	714	.000032	1.9	.0000	
2.699	.764018	722	7.18977	715	0.109036	1.9	1.0000	0.2
.000	.13040	723	.12303	716	.000038	1.9	.0000	
.002	.000805	724	.12309	716	.000040	1.9	.0000	
.004	.001612	724	.12305	717	.000042	1.9	.0000	
.006	.002419	725	.12303	718	.000044	1.9	.0000	
2.699	.764390	725	7.25461	719	0.109045	1.9	1.0000	0.2
.001	.000805	726	.12080	720	.000047	1.9	.0000	
.002	.001612	727	.12080	721	.000049	1.9	.0000	
.003	.002419	728	.12080	721	.000051	1.9	.0000	
.004	.003226	728	.12081	721	.000053	1.9	.0000	
2.695	.764172	729	7.26663	723	0.109053	1.9	1.0000	0.2
.000	.12002	729	.12002	723	.000057	1.9	.0000	
.002	.000805	731	.12000	724	.000059	1.9	.0000	
.004	.001612	731	.12003	724	.000061	1.9	.0000	
.006	.002419	732	.12002	725	.000062	1.9	.0000	
2.699	.764127	733	7.32663	725	0.109063	1.9	1.0000	0.2
.001	.12000	733	.12000	727	.000066	1.9	.0000	
.002	.000805	734	.12000	727	.000068	1.9	.0000	
.004	.001612	735	.12001	728	.000070	1.9	.0000	
.006	.002419	736	.12002	729	.000072	1.9	.0000	
2.695	.764100	736	7.36321	729	0.109073	1.8	1.0000	0.2
.001	.12000	737	.12001	729	.000075	1.8	.0000	
.002	.000805	738	.12002	731	.000077	1.8	.0000	
.004	.001612	739	.12003	731	.000079	1.8	.0000	
.006	.002419	739	.12003	734	.000081	1.8	.0000	
2.699	.764000	740	7.39568	733	0.109083	1.8	1.0000	0.2
.001	.12000	741	.12011	734	.000084	1.8	.0000	
.002	.000805	741	.12016	735	.000086	1.8	.0000	
.003	.001612	742	.12021	735	.000088	1.8	.0000	
.004	.002419	743	.12017	736	.000090	1.8	.0000	
2.695	.764000	744	7.42763	737	0.109092	1.8	1.0000	0.2
.001	.12000	744	.12020	738	.000094	1.8	.0000	
.002	.000805	745	.12028	739	.000095	1.8	.0000	
.004	.001612	746	.12029	739	.000097	1.8	.0000	
.006	.002419	747	.12029	740	.000099	1.8	.0000	
2.700	.764000	747	7.47347	741	0.109101	1.8	1.0000	0.2
u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
2.700	7.40626	747	7.47347	741	0.99101	1.8	1.0091	0.2
701	41.374	748	48088	741	0.99103	1.8	1.0091	
702	42.122	749	48830	742	0.99104	1.8	1.0090	
703	42.872	750	49572	743	0.99105	1.8	1.0090	
704	43.622	750	50315	744	0.99108	1.8	1.0090	
2.705	7.44372	751	7.51099	744	0.99110	1.8	1.0090	0.2
706	43.124	752	51804	745	0.99111	1.8	1.0090	
707	43.876	753	52550	746	0.99113	1.8	1.0089	
708	44.628	753	53296	747	0.99115	1.8	1.0089	
709	45.383	754	54043	747	0.99117	1.8	1.0089	
2.710	7.48137	755	7.54701	748	0.99118	1.8	1.0089	0.2
711	46.132	756	55530	749	0.99120	1.8	1.0089	
712	46.884	756	56288	750	0.99122	1.7	1.0089	
713	47.635	757	57038	750	0.99124	1.7	1.0088	
714	48.386	758	57789	751	0.99125	1.7	1.0088	
2.715	7.51920	759	7.58541	752	0.99127	1.7	1.0088	0.2
716	49.130	759	59293	753	0.99129	1.7	1.0088	
717	49.881	760	60040	753	0.99131	1.7	1.0088	
718	50.632	761	60789	754	0.99132	1.7	1.0088	
719	51.383	762	61535	755	0.99134	1.7	1.0087	
2.720	7.55722	762	7.62310	756	0.99136	1.7	1.0087	0.2
721	52.133	763	63066	756	0.99138	1.7	1.0087	
722	52.884	764	63823	757	0.99139	1.7	1.0087	
723	53.635	765	64580	758	0.99141	1.7	1.0087	
724	54.386	765	65330	759	0.99143	1.7	1.0086	
2.725	7.59543	766	7.66028	760	0.99144	1.7	1.0086	0.2
726	55.137	767	66088	760	0.99146	1.7	1.0086	
727	55.888	768	66840	761	0.99148	1.7	1.0086	
728	56.639	768	67590	762	0.99150	1.7	1.0086	
729	57.390	769	68342	763	0.99151	1.7	1.0086	
2.730	7.63383	770	7.69905	763	0.99153	1.7	1.0085	0.2
731	58.141	771	69090	764	0.99155	1.7	1.0085	
732	58.892	771	69843	765	0.99156	1.7	1.0085	
733	59.643	772	70596	766	0.99158	1.7	1.0085	
734	60.394	773	71350	766	0.99160	1.7	1.0085	
2.735	7.67242	774	7.73732	767	0.99161	1.7	1.0085	0.2
736	61.145	774	72102	768	0.99163	1.7	1.0085	
737	61.896	775	72858	769	0.99165	1.7	1.0084	
738	62.647	776	73613	770	0.99166	1.7	1.0084	
739	63.398	777	74368	770	0.99168	1.7	1.0084	
2.740	7.71121	778	7.77578	771	0.99170	1.7	1.0084	0.2
741	64.149	778	75149	772	0.99171	1.7	1.0084	
742	64.900	779	75902	773	0.99173	1.6	1.0083	
743	65.651	780	76655	774	0.99175	1.6	1.0083	
744	66.402	781	77408	774	0.99176	1.6	1.0083	
2.745	7.75018	781	7.81443	775	0.99178	1.6	1.0083	0.2
746	67.153	782	78161	776	0.99179	1.6	1.0083	
747	67.904	783	78915	777	0.99181	1.6	1.0083	
748	68.655	784	79668	777	0.99183	1.6	1.0082	
749	69.406	785	80421	778	0.99184	1.6	1.0082	
2.750	7.78935	785	7.85328	779	0.99186	1.6	1.0082	0.2
u	tan gd u	= F ₅ '	sec gd u	= F ₆ '	sin gd u	= F ₇ '	cos gd u	= F ₈ '

Natural Hyperbolic Functions.

x	$\sinh x$	$\cosh x$	$\tanh x$	$\coth x$	$\sinh x$	$\cosh x$	$\tanh x$	$\coth x$
2.750	7.26035	286	7.85538	779	0.99126	1.5	1.0082	0.2
.751	7.2721	286	7.86107	780	0.99128	1.5	1.0082	
.752	7.28397	287	7.86676	781	0.99130	1.5	1.0082	
.753	7.29583	288	7.87245	781	0.99131	1.5	1.0082	
.754	7.30769	288	7.87813	782	0.99132	1.5	1.0081	
2.755	7.31955	289	7.88382	783	0.99134	1.5	1.0081	0.2
.756	7.33141	290	7.88950	784	0.99135	1.5	1.0081	
.757	7.34327	291	7.89519	785	0.99137	1.5	1.0081	
.758	7.35513	292	7.90087	785	0.99139	1.5	1.0081	
.759	7.36699	292	7.90656	786	0.99140	1.5	1.0081	
2.760	7.37885	293	7.91224	787	0.99142	1.5	1.0080	0.2
.761	7.39071	294	7.91793	788	0.99143	1.5	1.0080	
.762	7.40257	295	7.92361	788	0.99145	1.5	1.0080	
.763	7.41443	296	7.92930	789	0.99146	1.5	1.0080	
.764	7.42629	296	7.93498	790	0.99148	1.5	1.0080	
2.765	7.43815	297	7.94067	791	0.99150	1.5	1.0080	0.2
.766	7.45001	298	7.94635	792	0.99151	1.5	1.0079	
.767	7.46187	299	7.95204	792	0.99153	1.5	1.0079	
.768	7.47373	300	7.95772	793	0.99154	1.5	1.0079	
.769	7.48559	300	7.96341	793	0.99156	1.5	1.0079	
2.770	7.49745	301	7.96909	795	0.99158	1.5	1.0079	0.2
.771	7.50931	302	7.97478	796	0.99159	1.5	1.0079	
.772	7.52117	303	7.98046	796	0.99161	1.5	1.0079	
.773	7.53303	304	7.98615	797	0.99162	1.5	1.0078	
.774	7.54489	304	7.99183	798	0.99164	1.5	1.0078	
2.775	7.55675	305	7.99752	799	0.99165	1.5	1.0078	0.2
.776	7.56861	306	8.00320	800	0.99167	1.5	1.0078	
.777	7.58047	307	8.00889	800	0.99169	1.5	1.0078	
.778	7.59233	308	8.01457	801	0.99170	1.5	1.0078	
.779	7.60419	308	8.02026	802	0.99172	1.5	1.0077	
2.780	7.61605	309	8.02594	803	0.99173	1.5	1.0077	0.2
.781	7.62791	310	8.03163	804	0.99175	1.5	1.0077	
.782	7.63977	311	8.03731	805	0.99176	1.5	1.0077	
.783	7.65163	312	8.04299	805	0.99178	1.5	1.0077	
.784	7.66349	312	8.04868	806	0.99179	1.5	1.0077	
2.785	7.67535	313	8.05436	807	0.99181	1.5	1.0077	0.2
.786	7.68721	314	8.06005	808	0.99182	1.5	1.0076	
.787	7.69907	315	8.06573	809	0.99184	1.5	1.0076	
.788	7.71093	316	8.07142	809	0.99185	1.5	1.0076	
.789	7.72279	316	8.07710	810	0.99187	1.5	1.0076	
2.790	7.73465	317	8.08279	811	0.99188	1.5	1.0076	0.2
.791	7.74651	318	8.08847	812	0.99190	1.5	1.0076	
.792	7.75837	319	8.09416	813	0.99191	1.5	1.0075	
.793	7.77023	320	8.09984	813	0.99193	1.5	1.0075	
.794	7.78209	320	8.10553	814	0.99194	1.5	1.0075	
2.795	7.79395	321	8.11121	815	0.99196	1.5	1.0075	0.2
.796	7.80581	322	8.11690	816	0.99197	1.5	1.0075	0.2
.797	7.81767	323	8.12258	817	0.99199	1.5	1.0075	0.2
.798	7.82953	324	8.12827	818	0.99200	1.5	1.0075	0.2
.799	7.84139	324	8.13395	818	0.99202	1.5	1.0074	0.1
2.800	7.85325	325	8.13964	819	0.99203	1.5	1.0074	0.1
x	$\sinh x$	$\cosh x$	$\tanh x$	$\coth x$	$\sinh x$	$\cosh x$	$\tanh x$	$\coth x$

Natural Hyperbolic Functions.

u	sinh u	= F'	cosh u	= F'	tanh u	= F'	coth u	= F'
2.800	8.10192	825	8.25273	819	0.00051	1.5	1.0074	0.1
.801	.20018	826	.20002	820	.00055	1.5	.0074	
.802	.20044	827	.20013	821	.00059	1.5	.0074	
.803	.20169	828	.20773	822	.00068	1.5	.0074	
.804	.22459	829	.26539	823	.00069	1.5	.0074	
2.805	8.23328	830	8.26379	824	0.00070	1.5	1.0073	0.1
.806	.24158	830	.30003	824	.00072	1.5	.0073	
.807	.24989	831	.30027	825	.00073	1.4	.0073	
.808	.25820	832	.31853	826	.00075	1.4	.0073	
.809	.26653	833	.32679	827	.00076	1.4	.0073	
2.810	8.27486	834	8.33506	827	0.00078	1.4	1.0073	0.1
.811	.28320	834	.34334	828	.00079	1.4	.0073	
.812	.29154	835	.35163	829	.00081	1.4	.0072	
.813	.29990	836	.35992	830	.00082	1.4	.0072	
.814	.30826	837	.36823	831	.00083	1.4	.0072	
2.815	8.31664	838	8.37664	832	0.00085	1.4	1.0072	0.1
.816	.32502	838	.37485	833	.00086	1.4	.0072	
.817	.33341	839	.38319	833	.00088	1.4	.0072	
.818	.34180	840	.39153	834	.00089	1.4	.0072	
.819	.35021	841	.40087	835	.00091	1.4	.0071	
2.820	8.35862	842	8.41823	836	0.00092	1.4	1.0071	0.1
.821	.35703	843	.40859	837	.00093	1.4	.0071	
.822	.36548	843	.41696	838	.00095	1.4	.0071	
.823	.37394	844	.42534	838	.00096	1.4	.0071	
.824	.38240	845	.43373	839	.00098	1.4	.0071	
2.825	8.40082	846	8.46013	840	0.00099	1.4	1.0071	0.1
.826	.40928	847	.44853	841	.00100	1.4	.0070	
.827	.41776	848	.45695	842	.00102	1.4	.0070	
.828	.42624	849	.46537	843	.00103	1.4	.0070	
.829	.43473	849	.47380	843	.00105	1.4	.0070	
2.830	8.44322	850	8.50224	844	0.00106	1.4	1.0070	0.1
.831	.45173	851	.48268	845	.00107	1.4	.0070	
.832	.46025	852	.49114	846	.00109	1.4	.0070	
.833	.46877	853	.49960	847	.00110	1.4	.0069	
.834	.47730	854	.50808	848	.00111	1.4	.0069	
2.835	8.48584	854	8.54486	849	0.00113	1.4	1.0069	0.1
.836	.49439	855	.51635	849	.00114	1.4	.0069	
.837	.50295	856	.52485	850	.00116	1.4	.0069	
.838	.51151	857	.53336	851	.00117	1.4	.0069	
.839	.52009	858	.54187	852	.00118	1.4	.0069	
2.840	8.52867	859	8.58770	853	0.00120	1.4	1.0069	0.1
.841	.53726	860	.55023	854	.00121	1.4	.0068	
.842	.54586	860	.55877	855	.00122	1.4	.0068	
.843	.55447	861	.56732	856	.00124	1.3	.0068	
.844	.56309	862	.57588	856	.00125	1.3	.0068	
2.845	8.57171	863	8.63085	857	0.00126	1.3	1.0068	0.1
.846	.58035	864	.58442	858	.00128	1.3	.0068	
.847	.58899	865	.59291	859	.00129	1.3	.0068	
.848	.59764	866	.60140	860	.00130	1.3	.0067	
.849	.60630	866	.60990	861	.00132	1.3	.0067	
2.850	8.61497	867	8.67281	861	0.00133	1.3	1.0067	0.1
u	tanh u	= F'	coth u	= F'	sinh u	= F'	cosh u	= F'

Natural Hyperbolic Functions.

x	$\sinh x$	$\cosh x$	$\tanh x$	$\coth x$	$\sinh x$	$\cosh x$	$\tanh x$	$\coth x$
0.00	0.00000	1.00000	0.00000	∞	0.00000	1.00000	0.00000	∞
0.01	0.01000	1.00500	0.00995	1.00505	0.01000	1.00500	0.00995	1.00505
0.02	0.02000	1.01005	0.01990	1.01010	0.02000	1.01005	0.01990	1.01010
0.03	0.03000	1.01515	0.02985	1.01520	0.03000	1.01515	0.02985	1.01520
0.04	0.04000	1.02030	0.03980	1.02035	0.04000	1.02030	0.03980	1.02035
0.05	0.05000	1.02550	0.04975	1.02555	0.05000	1.02550	0.04975	1.02555
0.06	0.06000	1.03075	0.05970	1.03080	0.06000	1.03075	0.05970	1.03080
0.07	0.07000	1.03605	0.06965	1.03610	0.07000	1.03605	0.06965	1.03610
0.08	0.08000	1.04140	0.07960	1.04145	0.08000	1.04140	0.07960	1.04145
0.09	0.09000	1.04680	0.08955	1.04685	0.09000	1.04680	0.08955	1.04685
0.10	0.10000	1.05225	0.09950	1.05230	0.10000	1.05225	0.09950	1.05230
0.11	0.11000	1.05775	0.10945	1.05780	0.11000	1.05775	0.10945	1.05780
0.12	0.12000	1.06330	0.11940	1.06335	0.12000	1.06330	0.11940	1.06335
0.13	0.13000	1.06890	0.12935	1.06895	0.13000	1.06890	0.12935	1.06895
0.14	0.14000	1.07455	0.13930	1.07460	0.14000	1.07455	0.13930	1.07460
0.15	0.15000	1.08025	0.14925	1.08030	0.15000	1.08025	0.14925	1.08030
0.16	0.16000	1.08600	0.15920	1.08605	0.16000	1.08600	0.15920	1.08605
0.17	0.17000	1.09180	0.16915	1.09185	0.17000	1.09180	0.16915	1.09185
0.18	0.18000	1.09765	0.17910	1.09770	0.18000	1.09765	0.17910	1.09770
0.19	0.19000	1.10355	0.18905	1.10360	0.19000	1.10355	0.18905	1.10360
0.20	0.20000	1.10950	0.19900	1.10955	0.20000	1.10950	0.19900	1.10955
0.21	0.21000	1.11550	0.20895	1.11555	0.21000	1.11550	0.20895	1.11555
0.22	0.22000	1.12155	0.21890	1.12160	0.22000	1.12155	0.21890	1.12160
0.23	0.23000	1.12765	0.22885	1.12770	0.23000	1.12765	0.22885	1.12770
0.24	0.24000	1.13380	0.23880	1.13385	0.24000	1.13380	0.23880	1.13385
0.25	0.25000	1.14000	0.24875	1.14005	0.25000	1.14000	0.24875	1.14005
0.26	0.26000	1.14625	0.25870	1.14630	0.26000	1.14625	0.25870	1.14630
0.27	0.27000	1.15255	0.26865	1.15260	0.27000	1.15255	0.26865	1.15260
0.28	0.28000	1.15890	0.27860	1.15895	0.28000	1.15890	0.27860	1.15895
0.29	0.29000	1.16530	0.28855	1.16535	0.29000	1.16530	0.28855	1.16535
0.30	0.30000	1.17175	0.29850	1.17180	0.30000	1.17175	0.29850	1.17180
0.31	0.31000	1.17825	0.30845	1.17830	0.31000	1.17825	0.30845	1.17830
0.32	0.32000	1.18480	0.31840	1.18485	0.32000	1.18480	0.31840	1.18485
0.33	0.33000	1.19140	0.32835	1.19145	0.33000	1.19140	0.32835	1.19145
0.34	0.34000	1.19805	0.33830	1.19810	0.34000	1.19805	0.33830	1.19810
0.35	0.35000	1.20475	0.34825	1.20480	0.35000	1.20475	0.34825	1.20480
0.36	0.36000	1.21150	0.35820	1.21155	0.36000	1.21150	0.35820	1.21155
0.37	0.37000	1.21830	0.36815	1.21835	0.37000	1.21830	0.36815	1.21835
0.38	0.38000	1.22515	0.37810	1.22520	0.38000	1.22515	0.37810	1.22520
0.39	0.39000	1.23205	0.38805	1.23210	0.39000	1.23205	0.38805	1.23210
0.40	0.40000	1.23900	0.39800	1.23905	0.40000	1.23900	0.39800	1.23905
0.41	0.41000	1.24600	0.40795	1.24605	0.41000	1.24600	0.40795	1.24605
0.42	0.42000	1.25305	0.41790	1.25310	0.42000	1.25305	0.41790	1.25310
0.43	0.43000	1.26015	0.42785	1.26020	0.43000	1.26015	0.42785	1.26020
0.44	0.44000	1.26730	0.43780	1.26735	0.44000	1.26730	0.43780	1.26735
0.45	0.45000	1.27450	0.44775	1.27455	0.45000	1.27450	0.44775	1.27455
0.46	0.46000	1.28175	0.45770	1.28180	0.46000	1.28175	0.45770	1.28180
0.47	0.47000	1.28905	0.46765	1.28910	0.47000	1.28905	0.46765	1.28910
0.48	0.48000	1.29640	0.47760	1.29645	0.48000	1.29640	0.47760	1.29645
0.49	0.49000	1.30380	0.48755	1.30385	0.49000	1.30380	0.48755	1.30385
0.50	0.50000	1.31125	0.49750	1.31130	0.50000	1.31125	0.49750	1.31130
0.51	0.51000	1.31875	0.50745	1.31880	0.51000	1.31875	0.50745	1.31880
0.52	0.52000	1.32630	0.51740	1.32635	0.52000	1.32630	0.51740	1.32635
0.53	0.53000	1.33390	0.52735	1.33395	0.53000	1.33390	0.52735	1.33395
0.54	0.54000	1.34155	0.53730	1.34160	0.54000	1.34155	0.53730	1.34160
0.55	0.55000	1.34925	0.54725	1.34930	0.55000	1.34925	0.54725	1.34930
0.56	0.56000	1.35700	0.55720	1.35705	0.56000	1.35700	0.55720	1.35705
0.57	0.57000	1.36480	0.56715	1.36485	0.57000	1.36480	0.56715	1.36485
0.58	0.58000	1.37265	0.57710	1.37270	0.58000	1.37265	0.57710	1.37270
0.59	0.59000	1.38055	0.58705	1.38060	0.59000	1.38055	0.58705	1.38060
0.60	0.60000	1.38850	0.59700	1.38855	0.60000	1.38850	0.59700	1.38855
0.61	0.61000	1.39650	0.60695	1.39655	0.61000	1.39650	0.60695	1.39655
0.62	0.62000	1.40455	0.61690	1.40460	0.62000	1.40455	0.61690	1.40460
0.63	0.63000	1.41265	0.62685	1.41270	0.63000	1.41265	0.62685	1.41270
0.64	0.64000	1.42080	0.63680	1.42085	0.64000	1.42080	0.63680	1.42085
0.65	0.65000	1.42900	0.64675	1.42905	0.65000	1.42900	0.64675	1.42905
0.66	0.66000	1.43725	0.65670	1.43730	0.66000	1.43725	0.65670	1.43730
0.67	0.67000	1.44555	0.66665	1.44560	0.67000	1.44555	0.66665	1.44560
0.68	0.68000	1.45390	0.67660	1.45395	0.68000	1.45390	0.67660	1.45395
0.69	0.69000	1.46230	0.68655	1.46235	0.69000	1.46230	0.68655	1.46235
0.70	0.70000	1.47075	0.69650	1.47080	0.70000	1.47075	0.69650	1.47080
0.71	0.71000	1.47925	0.70645	1.47930	0.71000	1.47925	0.70645	1.47930
0.72	0.72000	1.48780	0.71640	1.48785	0.72000	1.48780	0.71640	1.48785
0.73	0.73000	1.49640	0.72635	1.49645	0.73000	1.49640	0.72635	1.49645
0.74	0.74000	1.50505	0.73630	1.50510	0.74000	1.50505	0.73630	1.50510
0.75	0.75000	1.51375	0.74625	1.51380	0.75000	1.51375	0.74625	1.51380
0.76	0.76000	1.52250	0.75620	1.52255	0.76000	1.52250	0.75620	1.52255
0.77	0.77000	1.53130	0.76615	1.53135	0.77000	1.53130	0.76615	1.53135
0.78	0.78000	1.54015	0.77610	1.54020	0.78000	1.54015	0.77610	1.54020
0.79	0.79000	1.54905	0.78605	1.54910	0.79000	1.54905	0.78605	1.54910
0.80	0.80000	1.55800	0.79600	1.55805	0.80000	1.55800	0.79600	1.55805
0.81	0.81000	1.56700	0.80595	1.56705	0.81000	1.56700	0.80595	1.56705
0.82	0.82000	1.57605	0.81590	1.57610	0.82000	1.57605	0.81590	1.57610
0.83	0.83000	1.58515	0.82585	1.58520	0.83000	1.58515	0.82585	1.58520
0.84	0.84000	1.59430	0.83580	1.59435	0.84000	1.59430	0.83580	1.59435
0.85	0.85000	1.60350	0.84575	1.60355	0.85000	1.60350	0.84575	1.60355
0.86	0.86000	1.61275	0.85570	1.61280	0.86000	1.61275	0.85570	1.61280
0.87	0.87000	1.62205	0.86565	1.62210	0.87000	1.62205	0.86565	1.62210
0.88	0.88000	1.63140	0.87560	1.63145	0.88000	1.63140	0.87560	1.63145
0.89	0.89000	1.64080	0.88555	1.64085	0.89000	1.64080	0.88555	1.64085
0.90	0.90000	1.65025	0.89550	1.65030	0.90000	1.65025	0.89550	1.65030
0.91	0.91000	1.65975	0.90545	1.65980	0.91000	1.65975	0.90545	1.65980
0.92	0.92000	1.66930	0.91540	1.66935	0.92000	1.66930	0.91540	1.66935
0.93	0.93000	1.67890	0.92535	1.67895	0.93000	1.67890	0.92535	1.67895
0.94	0.94000	1.68855	0.93530	1.68860	0.94000	1.68855	0.93530	1.68860
0.95	0.95000	1.69825	0.94525	1.69830	0.95000	1.69825	0.94525	1.69830
0.96	0.96000	1.70800	0.95520	1.70805	0.96000	1.70800	0.95520	1.70805
0.97	0.97000	1.71780	0.96515	1.71785	0.97000	1.71780	0.96515	1.71785
0.98	0.98000	1.72765	0.97510	1.72770	0.98000	1.72765	0.97510	1.72770
0.99	0.99000	1.73755	0.98505	1.73760	0.99000	1.73755	0.98505	1.73760
1.00	1.00000	1.74750	0.99500	1.74755	1.00000	1.74750	0.99500	1.74755

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
2.000	9.69536	911	9.11498	906	0.99396	1.2	1.0051	0.1
.001	.00898	912	.12365	907	.00398	1.2	.0051	
.002	.01781	913	.12372	908	.00399	1.2	.0050	
.003	.02665	914	.12380	909	.00400	1.2	.0050	
.004	.03550	915	.12390	910	.00401	1.2	.0050	
2.005	9.10525	916	9.16000	911	0.99402	1.2	1.0050	0.1
.006	.11441	917	.16011	911	.00403	1.2	.0050	
.007	.12359	918	.17823	912	.00403	1.2	.0050	
.008	.13277	919	.18735	913	.00405	1.2	.0050	
.009	.14196	920	.19649	914	.00407	1.2	.0050	
2.010	9.15116	921	9.20964	915	0.99408	1.2	1.0050	0.1
.011	.15037	921	.21470	916	.00409	1.2	.0050	
.012	.15959	922	.22380	917	.00411	1.2	.0050	
.013	.16882	923	.23313	918	.00412	1.2	.0050	
.014	.17805	924	.24232	919	.00413	1.2	.0050	
2.015	9.16030	925	9.25151	920	0.99414	1.2	1.0050	0.1
.016	.18696	926	.25071	921	.00415	1.2	.0050	
.017	.19583	927	.26002	922	.00416	1.2	.0050	
.018	.20510	928	.26914	923	.00418	1.2	.0050	
.019	.21438	929	.27837	923	.00419	1.2	.0050	
2.020	9.21368	930	9.28961	924	0.99420	1.2	1.0050	0.1
.021	.22598	931	.28886	925	.00421	1.2	.0050	
.022	.23520	932	.29812	926	.00422	1.2	.0050	
.023	.24461	933	.30738	927	.00423	1.1	.0050	
.024	.25404	933	.31666	928	.00425	1.1	.0050	
2.025	9.26028	934	9.31205	929	0.99426	1.1	1.0050	0.1
.026	.26963	935	.32134	930	.00427	1.1	.0050	
.027	.27890	936	.33054	931	.00428	1.1	.0050	
.028	.28818	937	.33978	932	.00429	1.1	.0050	
.029	.29773	938	.34918	933	.00430	1.1	.0050	
2.030	9.33712	939	9.39951	934	0.99531	1.1	1.0050	0.1
.031	.31051	940	.39980	935	.00433	1.1	.0050	
.032	.31997	941	.40921	936	.00434	1.1	.0050	
.033	.32933	942	.41857	937	.00435	1.1	.0050	
.034	.33875	943	.42794	937	.00436	1.1	.0050	
2.035	9.38419	944	9.43732	938	0.99437	1.1	1.0050	0.1
.036	.36363	945	.44671	939	.00438	1.1	.0050	
.037	.37308	946	.45610	940	.00439	1.1	.0050	
.038	.38254	947	.46551	941	.00440	1.1	.0050	
.039	.39201	947	.47493	942	.00441	1.1	.0050	
2.040	9.43149	948	9.48436	943	0.99443	1.1	1.0050	0.1
.041	.44068	949	.49379	944	.00444	1.1	.0050	
.042	.45048	950	.50324	945	.00445	1.1	.0050	
.043	.45999	951	.51260	946	.00446	1.1	.0050	
.044	.46950	952	.52210	947	.00447	1.1	.0050	
2.045	9.47903	953	9.53163	948	0.99448	1.1	1.0050	0.1
.046	.48857	954	.54112	949	.00449	1.1	.0050	
.047	.49811	955	.55061	950	.00450	1.1	.0050	
.048	.50767	956	.56011	951	.00451	1.1	.0050	
.049	.51723	957	.56962	952	.00453	1.1	.0050	
2.050	9.52681	958	9.57915	953	0.99454	1.1	1.0050	0.1
u	tanh u	= F ₁ '	coth u	= F ₂ '	sinh u	= F ₃ '	cosh u	= F ₄ '

Natural Hyperbolic Functions.

u	sinh u	w F ₁ '	cosh u	w F ₂ '	tanh u	w F ₃ '	coth u	w F ₄ '
2.950	9.52681	998	9.57915	983	0.00454	1.1	1.0055	0.1
.951	.53630	999	.53668	984	.00455	1.1	.0055	
.952	.54998	999	.55022	983	.00459	1.1	.0055	
.953	.56359	999	.56377	980	.00457	1.1	.0055	
.954	.57630	998	.57633	957	.00458	1.1	.0055	
2.955	9.57482	995	9.62690	957	0.00459	1.1	1.0054	0.1
.956	.58445	994	.63648	958	.00460	1.1	.0054	
.957	.59410	995	.64607	949	.00461	1.1	.0054	
.958	.60375	996	.65567	950	.00462	1.1	.0054	
.959	.61341	997	.66528	961	.00463	1.1	.0054	
2.960	9.62308	997	9.67490	962	0.00464	1.1	1.0054	0.1
.961	.63276	998	.68452	963	.00465	1.1	.0054	
.962	.64245	999	.69416	954	.00467	1.1	.0054	
.963	.65214	999	.70381	965	.00468	1.1	.0054	
.964	.66185	991	.71347	966	.00469	1.1	.0053	
2.965	9.67157	992	9.72313	957	0.00470	1.1	1.0053	0.1
.966	.68130	993	.72281	968	.00471	1.1	.0053	
.967	.69104	994	.73249	969	.00472	1.1	.0053	
.968	.70078	995	.74219	970	.00473	1.1	.0053	
.969	.71054	996	.75190	971	.00474	1.0	.0053	
2.970	9.72031	997	9.77161	972	0.00475	1.0	1.0053	0.1
.971	.72008	998	.78134	973	.00476	1.0	.0053	
.972	.72987	999	.79107	974	.00477	1.0	.0053	
.973	.73967	980	.80082	975	.00478	1.0	.0052	
.974	.74947	981	.81057	976	.00479	1.0	.0052	
2.975	9.76939	982	9.82034	977	0.00480	1.0	1.0052	0.1
.976	.77911	983	.82011	978	.00481	1.0	.0052	
.977	.78886	984	.82989	979	.00482	1.0	.0052	
.978	.79860	985	.83969	980	.00483	1.0	.0052	
.979	.80835	986	.84949	981	.00484	1.0	.0052	
2.980	9.81811	987	9.86930	982	0.00485	1.0	1.0052	0.1
.981	.82839	988	.87913	983	.00486	1.0	.0052	
.982	.83827	989	.88896	984	.00487	1.0	.0052	
.983	.84816	990	.89880	985	.00488	1.0	.0051	
.984	.85807	991	.90866	986	.00489	1.0	.0051	
2.985	9.86798	992	9.91852	987	0.00490	1.0	1.0051	0.1
.986	.87790	993	.91839	988	.00491	1.0	.0051	
.987	.88784	994	.92828	989	.00492	1.0	.0051	
.988	.89778	995	.93817	990	.00493	1.0	.0051	
.989	.90773	996	.94807	991	.00494	1.0	.0051	
2.990	9.91770	997	9.96798	992	0.00495	1.0	1.0051	0.1
.991	.92767	998	.97791	993	.00497	1.0	.0051	
.992	.93765	999	.98784	994	.00498	1.0	.0051	
.993	.94765	1000	.99778	995	.00499	1.0	.0050	
.994	.95765	1001	10.00774	996	.00500	1.0	.0050	
2.995	9.96766	1002	10.01770	997	0.00501	1.0	1.0050	0.1
.996	.97768	1003	.02767	998	.00502	1.0	.0050	
.997	.98772	1004	.03765	999	.00503	1.0	.0050	
.998	.99776	1005	.04765	1000	.00504	1.0	.0050	
.999	10.00781	1006	.05765	1001	.00504	1.0	.0050	
3.000	10.01787	1007	10.06766	1002	0.00505	1.0	1.0050	0.1
u	tan gd u	w F ₁ '	sec gd u	w F ₂ '	sin gd u	w F ₃ '	cos gd u	w F ₄ '

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
3.00	10.0179	1007	10.0077	1002	0.99905	9.9	1.0050	1.0
.01	10.1191	1017	10.1083	1012	.99915	9.7	.0049	1.0
.02	10.2212	1027	10.2109	1022	.99925	9.5	.0048	1.0
.03	10.3245	1037	10.3137	1032	.99934	9.3	.0047	0.9
.04	10.4287	1048	10.4176	1043	.99943	9.1	.0046	0.9
3.05	10.5340	1058	10.5214	1053	0.99952	8.9	1.0045	0.9
.06	10.6403	1069	10.6272	1064	.99961	8.7	.0044	0.9
.07	10.7477	1079	10.7342	1075	.99970	8.6	.0043	0.9
.08	10.8562	1090	10.8423	1086	.99978	8.4	.0042	0.8
.09	10.9658	1101	11.0113	1097	.99987	8.2	.0041	0.8
3.10	11.0765	1112	11.1215	1108	0.99995	8.1	1.0041	0.8
.11	11.1882	1123	11.2328	1119	.99993	7.9	.0040	0.8
.12	11.3011	1135	11.3453	1130	.99991	7.8	.0039	0.8
.13	11.4151	1146	11.4588	1142	.99988	7.6	.0038	0.8
.14	11.5303	1157	11.5736	1153	.99986	7.5	.0038	0.8
3.15	11.6466	1169	11.6895	1165	0.99993	7.3	1.0037	0.7
.16	11.7641	1181	11.8065	1176	.99991	7.2	.0036	0.7
.17	11.8827	1192	11.9247	1188	.99988	7.0	.0035	0.7
.18	12.0025	1204	12.0442	1200	.99985	6.9	.0035	0.7
.19	12.1236	1216	12.1648	1212	.99982	6.8	.0034	0.7
3.20	12.2459	1229	12.2865	1225	0.99988	6.6	1.0033	0.7
.21	12.3694	1241	12.4097	1237	.99985	6.5	.0033	0.7
.22	12.4941	1253	12.5340	1249	.99981	6.4	.0032	0.6
.23	12.6200	1266	12.6595	1262	.99978	6.2	.0031	0.6
.24	12.7473	1279	12.7864	1275	.99974	6.1	.0031	0.6
3.25	12.8758	1291	12.9146	1288	0.99979	6.0	1.0030	0.6
.26	13.0056	1304	13.0440	1301	.99976	5.9	.0030	0.6
.27	13.1367	1317	13.1747	1314	.99972	5.8	.0029	0.6
.28	13.2691	1331	13.3067	1327	.99967	5.6	.0028	0.6
.29	13.4028	1344	13.4401	1340	.99963	5.5	.0028	0.6
3.30	13.5379	1357	13.5748	1354	0.99968	5.4	1.0027	0.5
.31	13.6743	1371	13.7108	1367	.99963	5.3	.0027	0.5
.32	13.8121	1385	13.8483	1381	.99959	5.2	.0026	0.5
.33	13.9513	1399	13.9871	1395	.99954	5.1	.0026	0.5
.34	14.0918	1413	14.1273	1409	.99950	5.0	.0025	0.5
3.35	14.2338	1427	14.2689	1423	0.99954	4.9	1.0025	0.5
.36	14.3772	1441	14.4120	1438	.99950	4.8	.0024	0.5
.37	14.5221	1456	14.5565	1452	.99944	4.7	.0024	0.5
.38	14.6684	1470	14.7024	1467	.99938	4.6	.0023	0.5
.39	14.8161	1485	14.8498	1482	.99933	4.5	.0023	0.5
3.40	14.9654	1500	14.9987	1497	0.99937	4.4	1.0022	0.4
.41	15.1161	1515	15.1491	1512	.99932	4.4	.0022	0.4
.42	15.2684	1530	15.3011	1527	.99926	4.3	.0021	0.4
.43	15.4221	1545	15.4545	1542	.99920	4.2	.0021	0.4
.44	15.5774	1561	15.6095	1558	.99915	4.1	.0021	0.4
3.45	15.7343	1577	15.7661	1573	0.99919	4.0	1.0020	0.4
.46	15.8928	1593	15.9242	1590	.99913	3.9	.0020	0.4
.47	16.0528	1608	16.0839	1605	.99907	3.9	.0019	0.4
.48	16.2145	1625	16.2453	1621	.99901	3.8	.0019	0.4
.49	16.3777	1641	16.4082	1638	.99894	3.7	.0019	0.4
3.50	16.5426	1657	16.5728	1654	0.99898	3.6	1.0018	0.4
u	tan gd u	= F ₅ '	sec gd u	= F ₆ '	sin gd u	= F ₇ '	cos gd u	= F ₈ '

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
3.50	16.5135	1657	16.5728	1654	0.99818	3.6	1.0018	0.1
.51	16.7002	1674	16.7301	1671	.99831	3.6	.0018	0.1
.52	16.8774	1691	16.9070	1688	.99845	3.5	.0018	0.1
.53	17.0473	1708	17.0770	1705	.99858	3.4	.0017	0.2
.54	17.2190	1725	17.2480	1722	.99872	3.4	.0017	0.3
3.55	17.3943	1742	17.4240	1739	0.99885	3.3	1.0017	0.3
.56	17.5694	1760	17.5988	1757	.99898	3.2	.0016	0.3
.57	17.7442	1777	17.7741	1774	.99912	3.2	.0016	0.3
.58	17.9208	1795	17.9507	1792	.99925	3.1	.0016	0.3
.59	18.0982	1813	18.1285	1810	.99938	3.0	.0015	0.3
3.60	18.2785	1831	18.3128	1829	0.99951	3.0	1.0015	0.3
.61	18.4605	1850	18.4966	1847	.99964	2.9	.0015	0.3
.62	18.6451	1868	18.6822	1866	.99977	2.9	.0014	0.3
.63	18.8312	1887	18.8697	1884	.99990	2.8	.0014	0.3
.64	19.0188	1906	19.0580	1903	.99992	2.8	.0014	0.3
3.65	19.2083	1925	19.2493	1922	0.99985	2.7	1.0014	0.3
.66	19.3998	1944	19.4415	1942	.99998	2.6	.0013	0.3
.67	19.5932	1963	19.6357	1961	.99990	2.6	.0013	0.3
.68	19.7885	1983	19.8324	1981	.99973	2.5	.0013	0.3
.69	19.9859	2003	20.0319	2001	.99955	2.5	.0012	0.3
3.70	20.1853	2024	20.2330	2021	0.99938	2.4	1.0012	0.3
.71	20.3867	2044	20.4359	2041	.99920	2.4	.0012	0.3
.72	20.5900	2064	20.6411	2062	.99903	2.3	.0012	0.3
.73	20.7951	2085	20.8476	2083	.99885	2.3	.0012	0.3
.74	21.0020	2106	21.0569	2103	.99867	2.3	.0011	0.3
3.75	21.2108	2127	21.2723	2125	0.99849	2.2	1.0011	0.3
.76	21.4215	2149	21.4852	2146	.99830	2.2	.0011	0.3
.77	21.6340	2170	21.7005	2168	.99811	2.1	.0011	0.3
.78	21.8483	2192	21.9164	2190	.99793	2.1	.0010	0.3
.79	22.0645	2214	22.1345	2212	.99775	2.0	.0010	0.3
3.80	22.2826	2236	22.3548	2234	0.99756	2.0	1.0010	0.3
.81	22.5026	2259	22.5769	2257	.99737	2.0	.0010	0.3
.82	22.7244	2281	22.8013	2279	.99718	1.9	.0010	0.3
.83	22.9480	2303	23.0261	2302	.99699	1.9	.0009	0.3
.84	23.1734	2327	23.2535	2325	.99680	1.8	.0009	0.3
3.85	23.4006	2351	23.4824	2349	0.99660	1.8	1.0009	0.3
.86	23.6296	2374	23.7132	2372	.99641	1.8	.0009	0.3
.87	23.8604	2398	23.9460	2396	.99621	1.7	.0009	0.3
.88	24.0930	2422	24.1824	2420	.99601	1.7	.0009	0.3
.89	24.3274	2447	24.4187	2445	.99581	1.7	.0008	0.3
3.90	24.5636	2471	24.7113	2469	0.99561	1.6	1.0008	0.3
.91	24.8015	2496	24.9508	2494	.99541	1.6	.0008	0.3
.92	25.0412	2521	25.1910	2519	.99521	1.5	.0008	0.3
.93	25.2827	2546	25.4333	2544	.99501	1.5	.0008	0.3
.94	25.5260	2572	25.6780	2570	.99481	1.5	.0008	0.3
3.95	25.7711	2598	25.9273	2596	0.99461	1.5	1.0007	0.1
.96	26.0180	2624	26.1752	2622	.99441	1.5	.0007	0.1
.97	26.2668	2650	26.5247	2648	.99421	1.4	.0007	0.1
.98	26.5174	2677	26.7769	2675	.99401	1.4	.0007	0.1
.99	26.7699	2704	27.0307	2702	.99381	1.4	.0007	0.1
4.00	27.2839	2731	27.3682	2729	0.99363	1.3	1.0007	0.1
u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
4.00	27.2899	2731	27.3082	2729	0.99933	1.3	1.0007	0.1
.01	27.5644	2758	27.5825	2750	.99934	1.3	.9997	
.02	27.8416	2785	27.8595	2784	.99935	1.3	.99965	
.03	28.1216	2814	28.1393	2812	.99937	1.3	.99960	
.04	28.4044	2842	28.4220	2840	.99938	1.2	.99955	
4.05	28.6800	2871	28.7074	2869	0.99939	1.2	1.0006	0.1
.06	28.9585	2900	28.9858	2898	.99941	1.2	.99955	
.07	29.2390	2929	29.2670	2927	.99942	1.2	.99955	
.08	29.5213	2958	29.5492	2956	.99943	1.1	.99955	
.09	29.8060	2988	29.8333	2986	.99944	1.1	.99955	
4.10	30.1619	3018	30.1781	3016	0.99945	1.1	1.0005	0.1
.11	30.4652	3048	30.4815	3047	.99946	1.1	.99955	
.12	30.7715	3079	30.7877	3077	.99947	1.1	.99955	
.13	31.0800	3110	31.0970	3108	.99948	1.0	.99955	
.14	31.3934	3141	31.4094	3139	.99949	1.0	.99955	
4.15	31.7091	3172	31.7249	3171	0.99950	1.0	1.0005	0.1
.16	32.0280	3204	32.0435	3203	.99951	1.0	.99955	
.17	32.3500	3237	32.3655	3235	.99952	1.0	.99955	
.18	32.6753	3269	32.6905	3268	.99953	0.9	.99955	
.19	33.0038	3302	33.0190	3300	.99954	0.9	.99955	
4.20	33.3357	3335	33.3507	3334	0.99955	0.9	1.0004	0.1
.21	33.6705	3360	33.6857	3357	.99956	0.9	.99955	
.22	34.0094	3402	34.0243	3401	.99957	0.9	.99955	
.23	34.3513	3437	34.3659	3435	.99958	0.8	.99955	
.24	34.6967	3471	34.7111	3470	.99958	0.8	.99955	
4.25	35.0456	3506	35.0598	3505	0.99959	0.8	1.0004	0.1
.26	35.3979	3541	35.4121	3540	.99960	0.8	.99955	
.27	35.7538	3577	35.7678	3575	.99961	0.8	.99955	
.28	36.1133	3613	36.1271	3611	.99962	0.8	.99955	
.29	36.4764	3649	36.4901	3648	.99962	0.8	.99955	
4.30	36.8431	3686	36.8567	3684	0.99963	0.7	1.0004	0.1
.31	37.2135	3723	37.2270	3721	.99964	0.7	.99955	
.32	37.5877	3760	37.6010	3759	.99965	0.7	.99955	
.33	37.9656	3768	37.9787	3767	.99965	0.7	.99955	
.34	38.3473	3816	38.3603	3815	.99966	0.7	.99955	
4.35	38.7328	3875	38.7457	3873	0.99967	0.7	1.0003	0.1
.36	39.1222	3913	39.1350	3912	.99967	0.7	.99955	
.37	39.5155	3953	39.5281	3952	.99968	0.6	.99955	
.38	39.9128	3993	39.9253	3991	.99969	0.6	.99955	
.39	40.3140	4033	40.3264	4031	.99969	0.6	.99955	
4.40	40.7193	4073	40.7316	4072	0.99970	0.6	1.0003	0.1
.41	41.1287	4114	41.1408	4113	.99970	0.6	.99955	
.42	41.5421	4155	41.5542	4154	.99971	0.6	.99955	
.43	41.9598	4197	41.9717	4195	.99972	0.6	.99955	
.44	42.3816	4230	42.3934	4228	.99972	0.6	.99955	
4.45	42.8076	4282	42.8193	4281	0.99973	0.5	1.0003	0.1
.46	43.2380	4325	43.2495	4324	.99973	0.5	.99955	
.47	43.6726	4368	43.6841	4367	.99974	0.5	.99955	
.48	44.1117	4412	44.1230	4411	.99974	0.5	.99955	
.49	44.5551	4457	44.5663	4456	.99975	0.5	.99955	
4.50	45.0030	4501	45.0141	4500	0.99975	0.5	1.0002	0.0
u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '

Natural Hyperbolic Functions.

u	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$	$\sinh u$	$= F_1'$	$\cosh u$	$= F_2'$
4.50	45.0030	4501	45.0141	4500	0.99975	0.5	1.00002	0.0
.51	45.4551	4547	45.4664	4546	.99976	0.5	.00002	
.52	45.9111	4593	45.9226	4591	.99976	0.5	.00002	
.53	46.3700	4639	46.3817	4637	.99977	0.5	.00002	
.54	46.8309	4685	46.8429	4684	.99977	0.5	.00002	
4.55	47.2939	4734	47.3055	4731	0.99978	0.4	1.00002	0.0
.56	47.7595	4780	47.7710	4779	.99978	0.4	.00002	
.57	48.2280	4826	48.2397	4825	.99979	0.4	.00002	
.58	48.6989	4870	48.7107	4873	.99979	0.4	.00002	
.59	49.1721	4915	49.1843	4914	.99979	0.4	.00002	
4.60	49.6377	4975	49.6497	4974	0.99980	0.4	1.00002	0.0
.61	50.1057	5025	50.1177	5024	.99980	0.4	.00002	
.62	50.5764	5075	50.5884	5074	.99980	0.4	.00002	
.63	51.0499	5125	51.0619	5125	.99981	0.4	.00002	
.64	51.5263	5175	51.5383	5177	.99981	0.4	.00002	
4.65	51.9977	5230	52.0097	5229	0.99982	0.4	1.00002	0.0
.66	52.4643	5281	52.4763	5281	.99982	0.4	.00002	
.67	52.9341	5335	52.9461	5334	.99982	0.4	.00002	
.68	53.4069	5389	53.4189	5388	.99983	0.3	.00002	
.69	53.8820	5444	53.8940	5442	.99983	0.3	.00002	
4.70	54.3500	5498	54.3620	5497	0.99984	0.3	1.00002	0.0
.71	54.8216	5553	54.8336	5552	.99984	0.3	.00002	
.72	55.2959	5609	55.3079	5608	.99984	0.3	.00002	
.73	55.7730	5665	55.7850	5664	.99984	0.3	.00002	
.74	56.2531	5722	56.2651	5721	.99985	0.3	.00002	
4.75	56.7268	5780	56.7388	5779	0.99985	0.3	1.00002	0.0
.76	57.2039	5838	57.2159	5837	.99985	0.3	.00002	
.77	57.6841	5896	57.6961	5895	.99986	0.3	.00001	
.78	58.1670	5956	58.1790	5955	.99986	0.3	.00001	
.79	58.6525	6015	58.6645	6015	.99986	0.3	.00001	
4.80	59.1301	6076	59.1421	6075	0.99986	0.3	1.00002	0.0
.81	59.6117	6137	59.6237	6136	.99987	0.3	.00001	
.82	60.0960	6199	60.1080	6198	.99987	0.3	.00001	
.83	60.5831	6261	60.5951	6260	.99987	0.3	.00001	
.84	61.0730	6324	61.0850	6323	.99987	0.3	.00001	
4.85	61.5651	6387	61.5771	6387	0.99988	0.2	1.00002	0.0
.86	62.0594	6452	62.0714	6451	.99988	0.2	.00001	
.87	62.5560	6516	62.5680	6516	.99988	0.2	.00001	
.88	63.0545	6581	63.0665	6581	.99988	0.2	.00001	
.89	63.5550	6648	63.5670	6647	.99989	0.2	.00001	
4.90	64.0581	6715	64.0701	6714	0.99989	0.2	1.00002	0.0
.91	64.5640	6782	64.5760	6782	.99989	0.2	.00001	
.92	65.0727	6850	65.0847	6850	.99989	0.2	.00001	
.93	65.5841	6919	65.5961	6919	.99990	0.2	.00001	
.94	66.0985	6989	66.1105	6988	.99990	0.2	.00001	
4.95	70.5839	7059	70.5959	7058	0.99990	0.2	1.00002	0.0
.96	71.0933	7130	71.1053	7130	.99990	0.2	.00001	
.97	72.0100	7202	72.0220	7201	.99990	0.2	.00001	
.98	72.9248	7274	72.9368	7273	.99991	0.2	.00001	
.99	73.8378	7347	73.8498	7346	.99991	0.2	.00001	
5.00	74.7492	7421	74.7612	7420	0.99991	0.2	1.00002	0.0
u	$\tan u$	$= F_1'$	$\sec u$	$= F_2'$	$\sin u$	$= F_1'$	$\cos u$	$= F_2'$

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	coth u	= F ₄ '
5.00	74.2038	7421	74.2090	7420	0.99991	0.2	1.00001	0.0
.01	74.2400	7490	74.9557	7495	.99991	0.2	.00001	
.02	75.7023	7571	75.7090	7570	.99991	0.2	.00001	
.03	76.4632	7647	76.4698	7646	.99991	0.2	.00001	
.04	77.2318	7724	77.2382	7723	.99992	0.2	.00001	
5.05	78.0080	7801	78.0144	7801	0.99992	0.2	1.00001	0.0
.06	78.7621	7880	78.7684	7879	.99992	0.2	.00001	
.07	79.5840	7950	79.5903	7958	.99992	0.2	.00001	
.08	80.3830	8030	80.3892	8038	.99992	0.2	.00001	
.09	81.1918	8120	81.1980	8119	.99992	0.2	.00001	
5.10	82.0079	8201	82.0140	8201	0.99993	0.1	1.00001	0.0
.11	82.8322	8284	82.8382	8283	.99993	0.1	.00001	
.12	83.6647	8367	83.6707	8366	.99993	0.1	.00001	
.13	84.5096	8451	84.5115	8451	.99993	0.1	.00001	
.14	85.3550	8536	85.3608	8535	.99993	0.1	.00001	
5.15	86.2128	8622	86.2186	8621	0.99993	0.1	1.00001	0.0
.16	87.0794	8709	87.0851	8708	.99993	0.1	.00001	
.17	87.9546	8796	87.9603	8795	.99994	0.1	.00001	
.18	88.8396	8884	88.8442	8884	.99994	0.1	.00001	
.19	89.7315	8974	89.7371	8973	.99994	0.1	.00001	
5.20	90.6334	9064	90.6390	9063	0.99994	0.1	1.00001	0.0
.21	91.5443	9155	91.5500	9154	.99994	0.1	.00001	
.22	92.4644	9247	92.4698	9246	.99994	0.1	.00001	
.23	93.3937	9340	93.3991	9339	.99994	0.1	.00001	
.24	94.3324	9434	94.3377	9433	.99994	0.1	.00001	
5.25	95.2805	9529	95.2858	9528	0.99994	0.1	1.00001	0.0
.26	96.2381	9624	96.2433	9624	.99995	0.1	.00001	
.27	97.2054	9721	97.2106	9721	.99995	0.1	.00001	
.28	98.1824	9819	98.1875	9818	.99995	0.1	.00001	
.29	99.1692	9917	99.1742	9917	.99995	0.1	.00001	
5.30	100.1669	10017	100.1720	10017	0.99995	0.1	1.00000	0.0
.31	101.1726	10118	101.1776	10117	.99995	0.1	.00000	
.32	102.1805	10219	102.1844	10219	.99995	0.1	.00000	
.33	103.1906	10322	103.1944	10322	.99995	0.1	.00000	
.34	104.2040	10426	104.2088	10425	.99995	0.1	.00000	
5.35	105.2218	10531	105.2265	10530	0.99995	0.1	1.00000	0.0
.36	106.2501	10636	106.2548	10636	.99996	0.1	.00000	
.37	107.2801	10743	107.2838	10743	.99996	0.1	.00000	
.38	108.3128	10851	108.3164	10851	.99996	0.1	.00000	
.39	109.3504	10960	109.3540	10960	.99996	0.1	.00000	
5.40	110.3939	11071	110.3985	11070	0.99996	0.1	1.00000	0.0
.41	111.4436	11182	111.4480	11181	.99996	0.1	.00000	
.42	112.4997	11294	112.5041	11294	.99996	0.1	.00000	
.43	113.5624	11308	113.5668	11307	.99996	0.1	.00000	
.44	114.6318	11422	114.6362	11422	.99996	0.1	.00000	
5.45	115.7079	11538	115.7122	11538	0.99996	0.1	1.00000	0.0
.46	116.7906	11655	116.7948	11655	.99996	0.1	.00000	
.47	117.8800	11773	117.8842	11773	.99996	0.1	.00000	
.48	118.9761	11893	118.9802	11892	.99997	0.1	.00000	
.49	120.0789	12013	120.0830	12013	.99997	0.1	.00000	
5.50	121.1883	12135	121.1924	12134	0.99997	0.1	1.00000	0.0
u	tan gd u	= F ₅ '	sec gd u	= F ₆ '	sin gd u	= F ₇ '	csc gd u	= F ₈ '

Natural Hyperbolic Functions.

u	sinh u	= F ₁ '	cosh u	= F ₂ '	tanh u	= F ₃ '	cath u	= F ₄ '
5.50	122.3430	12235	122.3480	12234	0.99997	0.1	1.0000	0.0
.51	123.5735	12358	123.5776	12357	.99997	0.1	.9999	.0000
.52	124.8155	12482	124.8195	12481	.99997	0.1	.9999	.0000
.53	126.0700	12607	126.0739	12607	.99997	0.1	.9999	.0000
.54	127.3370	12734	127.3410	12734	.99997	0.1	.9999	.0000
5.55	128.6168	12862	128.6207	12862	0.99997	0.1	1.0000	0.0
.56	129.9095	12991	129.9133	12991	.99997	0.1	.9999	.0000
.57	131.2151	13122	131.2190	13122	.99997	0.1	.9999	.0000
.58	132.5330	13254	132.5377	13253	.99997	0.1	.9999	.0000
.59	133.8630	13387	133.8667	13387	.99997	0.1	.9999	.0000
5.60	135.2144	13522	135.2180	13521	0.99997	0.1	1.0000	0.0
.61	136.5793	13657	136.5829	13657	.99997	0.1	.9999	.0000
.62	137.9570	13798	137.9605	13794	.99997	0.1	.9999	.0000
.63	139.3473	13933	139.3507	13933	.99997	0.1	.9999	.0000
.64	140.7500	14073	140.7533	14073	.99997	0.1	.9999	.0000
5.65	142.1440	14215	142.1475	14214	0.99998	0.0	1.0000	0.0
.66	143.5520	14358	143.5554	14357	.99998	0.0	.9999	.0000
.67	144.9735	14492	144.9768	14492	.99998	0.0	.9999	.0000
.68	146.4080	14648	146.4112	14647	.99998	0.0	.9999	.0000
.69	147.8551	14785	147.8582	14785	.99998	0.0	.9999	.0000
5.70	149.3140	14934	149.3174	14933	0.99998	0.0	1.0000	0.0
.71	150.7850	15084	150.7883	15083	.99998	0.0	.9999	.0000
.72	152.2680	15245	152.2712	15245	.99998	0.0	.9999	.0000
.73	153.7630	15399	153.7661	15398	.99998	0.0	.9999	.0000
.74	155.2700	15553	155.2730	15553	.99998	0.0	.9999	.0000
5.75	157.0008	15710	157.0040	15709	0.99998	0.0	1.0000	0.0
.76	158.6726	15868	158.6757	15867	.99998	0.0	.9999	.0000
.77	160.3673	16027	160.3704	16027	.99998	0.0	.9999	.0000
.78	162.0851	16288	162.0881	16288	.99998	0.0	.9999	.0000
.79	163.8150	16351	163.8180	16350	.99998	0.0	.9999	.0000
5.80	165.5581	16515	165.5611	16515	0.99998	0.0	1.0000	0.0
.81	167.3240	16781	167.3270	16781	.99998	0.0	.9999	.0000
.82	169.1030	16949	169.1060	16948	.99998	0.0	.9999	.0000
.83	170.8950	17018	170.8980	17018	.99998	0.0	.9999	.0000
.84	172.7000	17189	172.7030	17189	.99998	0.0	.9999	.0000
5.85	173.6168	17362	173.6198	17362	0.99998	0.0	1.0000	0.0
.86	175.3500	17535	175.3530	17535	.99998	0.0	.9999	.0000
.87	177.1231	17713	177.1261	17712	.99998	0.0	.9999	.0000
.88	178.9232	17892	178.9262	17892	.99998	0.0	.9999	.0000
.89	180.7403	18070	180.7433	18070	.99998	0.0	.9999	.0000
5.90	182.5744	18252	182.5774	18252	0.99998	0.0	1.0000	0.0
.91	184.3517	18435	184.3547	18435	.99999	0.0	.9999	.0000
.92	186.1445	18621	186.1475	18620	.99999	0.0	.9999	.0000
.93	187.9530	18808	187.9560	18808	.99999	0.0	.9999	.0000
.94	189.7761	18997	189.7791	18997	.99999	0.0	.9999	.0000
5.95	191.8754	19188	191.8784	19188	0.99999	0.0	1.0000	0.0
.96	193.8038	19381	193.8068	19380	.99999	0.0	.9999	.0000
.97	195.7516	19573	195.7546	19573	.99999	0.0	.9999	.0000
.98	197.7180	19772	197.7210	19772	.99999	0.0	.9999	.0000
.99	199.7051	19971	199.7081	19971	.99999	0.0	.9999	.0000
6.00	201.7132	20172	201.7162	20171	0.99999	0.0	1.0000	0.0
u	tan gd u	= F ₁ '	sec gd u	= F ₂ '	sin gd u	= F ₃ '	cos gd u	= F ₄ '

TABLE III

NATURAL AND LOGARITHMIC CIRCULAR FUNCTIONS

Circular Functions.

u	$\sin u$	$u \text{ } ^\circ$	$\cos u$	$u \text{ } ^\circ$	$\log \sin u$	$u \text{ } ^\circ$	$\log \cos u$	$u \text{ } ^\circ$	u
0.0000	0.00000	10.0	1.00000	0.0	— ∞	+ ∞	0.00000	0.0	0 00 00.00
.0001	.00010		.99990		6.00000	43429.4	.00000		0 00 30.63
.0002	.00020		.99980		.39103	21714.7	.00000		0 00 41.25
.0003	.00030		.99970		.47712	14476.5	.00000		0 01 01.68
.0004	.00040		.99960		.56226	10847.4	.00000		0 01 22.51
0.0005	0.00050	10.0	1.00000	0.0	6.60807	8085.0	0.00000	0.0	0 01 43.13
.0006	.00060		.99990		.77815	7238.2	.00000		0 02 03.76
.0007	.00070		.99980		.81510	6204.2	.00000		0 02 24.39
.0008	.00080		.99970		.90309	5428.7	.00000		0 02 45.01
.0009	.00090		.99960		.95424	4875.5	.00000		0 03 05.64
0.0010	0.00100	10.0	1.00000	0.0	7.00000	4342.9	0.00000	0.0	0 03 26.26
.0011	.00110		.99990		.04130	3048.1	.00000		0 03 46.89
.0012	.00120		.99980		.09118	2610.1	.00000		0 04 07.52
.0013	.00130		.99970		.11304	2349.7	.00000		0 04 28.14
.0014	.00140		.99960		.14013	2102.1	.00000		0 04 48.77
0.0015	0.00150	10.0	1.00000	0.0	7.17000	2895.3	0.00000	0.0	0 05 09.40
.0016	.00160		.99990		.19412	2714.3	.00000		0 05 30.02
.0017	.00170		.99980		.23045	2554.7	.00000		0 05 50.65
.0018	.00180		.99970		.25527	2413.7	.00000		0 06 11.28
.0019	.00190		.99960		.27875	2285.8	.00000		0 06 31.90
0.0020	0.00200	10.0	1.00000	0.0	7.30103	2171.5	0.00000	0.0	0 06 52.53
.0021	.00210		.99990		.32222	2008.1	.00000		0 07 13.16
.0022	.00220		.99980		.34242	1974.1	.00000		0 07 33.78
.0023	.00230		.99970		.36173	1882.2	.00000		0 07 54.41
.0024	.00240		.99960		.38021	1802.6	.00000		0 08 15.04
0.0025	0.00250	10.0	1.00000	0.0	7.30794	1737.2	0.00000	0.0	0 08 35.66
.0026	.00260		.99990		.41407	1670.4	.00000		0 08 56.29
.0027	.00270		.99980		.43135	1608.5	.00000		0 09 16.91
.0028	.00280		.99970		.44716	1551.6	.00000		0 09 37.54
.0029	.00290		.99960		.46240	1497.6	.00000		0 09 58.17
0.0030	0.00300	10.0	1.00000	0.0	7.47712	1447.6	0.00000	0.0	0 10 18.79
.0031	.00310		.99990		.49135	1400.9	.00000		0 10 39.42
.0032	.00320		.99980		.50515	1357.2	.00000		0 11 00.05
.0033	.00330		.99970		.51885	1316.0	.00000		0 11 20.67
.0034	.00340		.99960		.53148	1277.3	.00000		0 11 41.30
0.0035	0.00350	10.0	0.99999	0.0	7.54407	1240.8	0.00000	0.0	0 12 01.93
.0036	.00360		.99990		.55590	1206.4	.00000		0 12 22.55
.0037	.00370		.99980		.56800	1173.8	.00000		0 12 43.18
.0038	.00380		.99970		.57978	1142.9	.00000		0 13 03.81
.0039	.00390		.99960		.59106	1113.6	.00000		0 13 24.43
0.0040	0.00400	10.0	0.99999	0.0	7.60206	1085.7	0.00000	0.0	0 13 45.06
.0041	.00410		.99990		.61278	1059.2	.00000		0 14 05.69
.0042	.00420		.99980		.62325	1034.0	.00000		0 14 26.31
.0043	.00430		.99970		.63347	1010.0	.00000		0 14 46.94
.0044	.00440		.99960		.64345	987.0	.00000		0 15 07.57
0.0045	0.00450	10.0	0.99999	0.0	7.65321	965.1	0.00000	0.0	0 15 28.19
.0046	.00460		.99990		.66276	944.1	.00000		0 15 48.82
.0047	.00470		.99980		.67210	924.0	.00000		0 16 09.44
.0048	.00480		.99970		.68124	904.8	.00000		0 16 30.07
.0049	.00490		.99960		.69019	886.3	0.00000		0 16 50.70
0.0050	0.00500	10.0	0.99999	0.0	7.69897	868.6	0.00000	0.0	0 17 11.32
u	$-\sin u$	$u \text{ } ^\circ$	$\cos u$	$u \text{ } ^\circ$	$\log \frac{\sin u}{1}$	$u \text{ } ^\circ$	$\log \cos u$	$u \text{ } ^\circ$	u

GUTHRIE'S TABLES

Circular Functions.

α	$\sin \alpha$	$\cos \alpha$	$\tan \alpha$	$\cot \alpha$	$\sec \alpha$	$\csc \alpha$	$\log \sin \alpha$	$\log \cos \alpha$	$\log \tan \alpha$	$\log \cot \alpha$	$\log \sec \alpha$	$\log \csc \alpha$	α
.0000	0.00000	1.00000	0.00000	0.00000	1.00000	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0° 0' 0.00"
.0001	0.00010	0.99990	0.00010	9.99990	1.00010	1.00010	0.00004	0.00000	0.00004	0.00000	0.00004	0.00004	0° 0' 1.13"
.0002	0.00020	0.99980	0.00020	9.99980	1.00040	1.00040	0.00008	0.00000	0.00008	0.00000	0.00008	0.00008	0° 0' 2.26"
.0003	0.00030	0.99970	0.00030	9.99970	1.00070	1.00070	0.00012	0.00000	0.00012	0.00000	0.00012	0.00012	0° 0' 3.39"
.0004	0.00040	0.99960	0.00040	9.99960	1.00100	1.00100	0.00016	0.00000	0.00016	0.00000	0.00016	0.00016	0° 0' 4.52"
.0005	0.00050	0.99950	0.00050	9.99950	1.00130	1.00130	0.00020	0.00000	0.00020	0.00000	0.00020	0.00020	0° 0' 5.65"
.0006	0.00060	0.99940	0.00060	9.99940	1.00160	1.00160	0.00024	0.00000	0.00024	0.00000	0.00024	0.00024	0° 0' 6.78"
.0007	0.00070	0.99930	0.00070	9.99930	1.00190	1.00190	0.00028	0.00000	0.00028	0.00000	0.00028	0.00028	0° 0' 7.91"
.0008	0.00080	0.99920	0.00080	9.99920	1.00220	1.00220	0.00032	0.00000	0.00032	0.00000	0.00032	0.00032	0° 0' 9.04"
.0009	0.00090	0.99910	0.00090	9.99910	1.00250	1.00250	0.00036	0.00000	0.00036	0.00000	0.00036	0.00036	0° 0' 10.17"
.0010	0.00100	0.99900	0.00100	9.99900	1.00280	1.00280	0.00040	0.00000	0.00040	0.00000	0.00040	0.00040	0° 0' 11.30"
.0011	0.00110	0.99890	0.00110	9.99890	1.00310	1.00310	0.00044	0.00000	0.00044	0.00000	0.00044	0.00044	0° 0' 12.43"
.0012	0.00120	0.99880	0.00120	9.99880	1.00340	1.00340	0.00048	0.00000	0.00048	0.00000	0.00048	0.00048	0° 0' 13.56"
.0013	0.00130	0.99870	0.00130	9.99870	1.00370	1.00370	0.00052	0.00000	0.00052	0.00000	0.00052	0.00052	0° 0' 14.69"
.0014	0.00140	0.99860	0.00140	9.99860	1.00400	1.00400	0.00056	0.00000	0.00056	0.00000	0.00056	0.00056	0° 0' 15.82"
.0015	0.00150	0.99850	0.00150	9.99850	1.00430	1.00430	0.00060	0.00000	0.00060	0.00000	0.00060	0.00060	0° 0' 16.95"
.0016	0.00160	0.99840	0.00160	9.99840	1.00460	1.00460	0.00064	0.00000	0.00064	0.00000	0.00064	0.00064	0° 0' 18.08"
.0017	0.00170	0.99830	0.00170	9.99830	1.00490	1.00490	0.00068	0.00000	0.00068	0.00000	0.00068	0.00068	0° 0' 19.21"
.0018	0.00180	0.99820	0.00180	9.99820	1.00520	1.00520	0.00072	0.00000	0.00072	0.00000	0.00072	0.00072	0° 0' 20.34"
.0019	0.00190	0.99810	0.00190	9.99810	1.00550	1.00550	0.00076	0.00000	0.00076	0.00000	0.00076	0.00076	0° 0' 21.47"
.0020	0.00200	0.99800	0.00200	9.99800	1.00580	1.00580	0.00080	0.00000	0.00080	0.00000	0.00080	0.00080	0° 0' 22.60"
.0021	0.00210	0.99790	0.00210	9.99790	1.00610	1.00610	0.00084	0.00000	0.00084	0.00000	0.00084	0.00084	0° 0' 23.73"
.0022	0.00220	0.99780	0.00220	9.99780	1.00640	1.00640	0.00088	0.00000	0.00088	0.00000	0.00088	0.00088	0° 0' 24.86"
.0023	0.00230	0.99770	0.00230	9.99770	1.00670	1.00670	0.00092	0.00000	0.00092	0.00000	0.00092	0.00092	0° 0' 25.99"
.0024	0.00240	0.99760	0.00240	9.99760	1.00700	1.00700	0.00096	0.00000	0.00096	0.00000	0.00096	0.00096	0° 0' 27.12"
.0025	0.00250	0.99750	0.00250	9.99750	1.00730	1.00730	0.00100	0.00000	0.00100	0.00000	0.00100	0.00100	0° 0' 28.25"
.0026	0.00260	0.99740	0.00260	9.99740	1.00760	1.00760	0.00104	0.00000	0.00104	0.00000	0.00104	0.00104	0° 0' 29.38"
.0027	0.00270	0.99730	0.00270	9.99730	1.00790	1.00790	0.00108	0.00000	0.00108	0.00000	0.00108	0.00108	0° 0' 30.51"
.0028	0.00280	0.99720	0.00280	9.99720	1.00820	1.00820	0.00112	0.00000	0.00112	0.00000	0.00112	0.00112	0° 0' 31.64"
.0029	0.00290	0.99710	0.00290	9.99710	1.00850	1.00850	0.00116	0.00000	0.00116	0.00000	0.00116	0.00116	0° 0' 32.77"
.0030	0.00300	0.99700	0.00300	9.99700	1.00880	1.00880	0.00120	0.00000	0.00120	0.00000	0.00120	0.00120	0° 0' 33.90"
.0031	0.00310	0.99690	0.00310	9.99690	1.00910	1.00910	0.00124	0.00000	0.00124	0.00000	0.00124	0.00124	0° 0' 35.03"
.0032	0.00320	0.99680	0.00320	9.99680	1.00940	1.00940	0.00128	0.00000	0.00128	0.00000	0.00128	0.00128	0° 0' 36.16"
.0033	0.00330	0.99670	0.00330	9.99670	1.00970	1.00970	0.00132	0.00000	0.00132	0.00000	0.00132	0.00132	0° 0' 37.29"
.0034	0.00340	0.99660	0.00340	9.99660	1.01000	1.01000	0.00136	0.00000	0.00136	0.00000	0.00136	0.00136	0° 0' 38.42"
.0035	0.00350	0.99650	0.00350	9.99650	1.01030	1.01030	0.00140	0.00000	0.00140	0.00000	0.00140	0.00140	0° 0' 39.55"
.0036	0.00360	0.99640	0.00360	9.99640	1.01060	1.01060	0.00144	0.00000	0.00144	0.00000	0.00144	0.00144	0° 0' 40.68"
.0037	0.00370	0.99630	0.00370	9.99630	1.01090	1.01090	0.00148	0.00000	0.00148	0.00000	0.00148	0.00148	0° 0' 41.81"
.0038	0.00380	0.99620	0.00380	9.99620	1.01120	1.01120	0.00152	0.00000	0.00152	0.00000	0.00152	0.00152	0° 0' 42.94"
.0039	0.00390	0.99610	0.00390	9.99610	1.01150	1.01150	0.00156	0.00000	0.00156	0.00000	0.00156	0.00156	0° 0' 44.07"
.0040	0.00400	0.99600	0.00400	9.99600	1.01180	1.01180	0.00160	0.00000	0.00160	0.00000	0.00160	0.00160	0° 0' 45.20"
.0041	0.00410	0.99590	0.00410	9.99590	1.01210	1.01210	0.00164	0.00000	0.00164	0.00000	0.00164	0.00164	0° 0' 46.33"
.0042	0.00420	0.99580	0.00420	9.99580	1.01240	1.01240	0.00168	0.00000	0.00168	0.00000	0.00168	0.00168	0° 0' 47.46"
.0043	0.00430	0.99570	0.00430	9.99570	1.01270	1.01270	0.00172	0.00000	0.00172	0.00000	0.00172	0.00172	0° 0' 48.59"
.0044	0.00440	0.99560	0.00440	9.99560	1.01300	1.01300	0.00176	0.00000	0.00176	0.00000	0.00176	0.00176	0° 0' 49.72"
.0045	0.00450	0.99550	0.00450	9.99550	1.01330	1.01330	0.00180	0.00000	0.00180	0.00000	0.00180	0.00180	0° 0' 50.85"
.0046	0.00460	0.99540	0.00460	9.99540	1.01360	1.01360	0.00184	0.00000	0.00184	0.00000	0.00184	0.00184	0° 0' 51.98"
.0047	0.00470	0.99530	0.00470	9.99530	1.01390	1.01390	0.00188	0.00000	0.00188	0.00000	0.00188	0.00188	0° 0' 53.11"
.0048	0.00480	0.99520	0.00480	9.99520	1.01420	1.01420	0.00192	0.00000	0.00192	0.00000	0.00192	0.00192	0° 0' 54.24"
.0049	0.00490	0.99510	0.00490	9.99510	1.01450	1.01450	0.00196	0.00000	0.00196	0.00000	0.00196	0.00196	0° 0' 55.37"
.0050	0.00500	0.99500	0.00500	9.99500	1.01480	1.01480	0.00200	0.00000	0.00200	0.00000	0.00200	0.00200	0° 0' 56.50"
.0051	0.00510	0.99490	0.00510	9.99490	1.01510	1.01510	0.00204	0.00000	0.00204	0.00000	0.00204	0.00204	0° 0' 57.63"
.0052	0.00520	0.99480	0.00520	9.99480	1.01540	1.01540	0.00208	0.00000	0.00208	0.00000	0.00208	0.00208	0° 0' 58.76"
.0053	0.00530	0.99470	0.00530	9.99470	1.01570	1.01570	0.00212	0.00000	0.00212	0.00000	0.00212	0.00212	0° 0' 59.89"
.0054	0.00540	0.99460	0.00540	9.99460	1.01600	1.01600	0.00216	0.00000	0.00216	0.00000	0.00216	0.00216	0° 0' 61.02"
.0055	0.00550	0.99450	0.00550	9.99450	1.01630	1.01630	0.00220	0.00000	0.00220	0.00000	0.00220	0.00220	0° 0' 62.15"
.0056	0.00560	0.99440	0.00560	9.99440	1.01660	1.01660	0.00224	0.00000	0.00224	0.00000	0.00224	0.00224	0° 0' 63.28"
.0057	0.00570	0.99430	0.00570	9.99430	1.01690	1.01690	0.00228	0.00000	0.00228	0.00000	0.00228	0.00228	0° 0' 64.41"
.0058	0.00580	0.99420	0.00580	9.99420	1.01720	1.01720	0.00232	0.00000	0.00232	0.00000	0.00232	0.00232	0° 0' 65.54"
.0059	0.00590	0.99410	0.00590	9.99410	1.01750	1.01750	0.00236	0.00000	0.00236	0.00000	0.00236	0.00236	0° 0' 66.67"
.0060	0.00600	0.99400	0.00600	9.99400	1.01780	1.01780	0.00240	0.00000	0.00240	0.00000	0.00240	0.00240	0° 0' 67.80"
.0061	0.00610	0.99390	0.00610	9.99390	1.01810	1.01810	0.00244	0.00000	0.00244	0.00000	0.00244	0.00244	0° 0' 68.93"
.0062	0.00620	0.99380	0.00620	9.99380	1.01840	1.01840	0.00248	0.00000	0.00248	0.00000	0.00248	0.00248	0° 0' 70.06"
.0063	0.00630	0.99370	0.00630	9.99370	1.01870	1.01870	0.00252	0.00000	0.00252	0.00000	0.00252	0.00252	0° 0' 71.19"
.0064	0.00640	0.99360	0.00640	9.99360	1.01900	1.01900	0.00256	0.00000	0.00256	0.00000	0.00256	0.00256	0° 0' 72.32"
.0065	0.00650	0.99350	0.00650	9.99350	1.01930	1.01930	0.00260	0.00000	0.00260	0.00000	0.00260	0.00260	0° 0' 73.45"
.0066	0.00660	0.99340	0.00660	9.99340	1.01960	1.01960	0.00264	0.00000	0.00264	0.00000	0.00264	0.00264	0° 0' 74.58"
.0067	0.00670	0.99330	0.00670	9.99330	1.01990	1.01990	0.00268	0.00000	0.00268	0.00000	0.00268	0.00268	0° 0' 75.71"
.0068	0.00680	0.99320	0.00680	9.99320	1.02020	1.02020	0.00272	0.00000	0.00272	0.00000	0.00272	0.00272	0° 0' 76.84"
.0069	0.00690	0.99310	0.00690	9.99310	1.02050								

Circular Functions.

u	$\sin u$	$\cos u$	$\tan u$	$\sec u$	$\csc u$	$\cot u$	$\log \sin u$	$\log \cos u$	$\log \tan u$	$\log \sec u$	$\log \csc u$	$\log \cot u$	
0.0000	0.00000	1.00000	0.00000	0.1	7.99999	434.3	9.99998	0.0	0.34	22.65	0.34	22.65	
0.0001	0.00010	0.99999	0.00010	0.00010	10000	0.00010	8.00000	430.0	0.00000	0.34	43.27	0.34	43.27
0.0002	0.00020	0.99998	0.00020	0.00020	50000	0.00020	8.00000	425.8	0.00000	0.35	63.90	0.35	63.90
0.0003	0.00030	0.99997	0.00030	0.00030	33333	0.00030	8.00000	421.6	0.00000	0.35	84.53	0.35	84.53
0.0004	0.00040	0.99996	0.00040	0.00040	25000	0.00040	8.00000	417.4	0.00000	0.35	105.15	0.35	105.15
0.0005	0.00050	0.99995	0.00050	0.00050	20000	0.00050	8.00000	413.2	0.00000	0.36	125.78	0.36	125.78
0.0006	0.00060	0.99994	0.00060	0.00060	16667	0.00060	8.00000	409.0	0.00000	0.36	146.41	0.36	146.41
0.0007	0.00070	0.99993	0.00070	0.00070	14286	0.00070	8.00000	404.8	0.00000	0.36	167.03	0.36	167.03
0.0008	0.00080	0.99992	0.00080	0.00080	12500	0.00080	8.00000	400.6	0.00000	0.37	187.66	0.37	187.66
0.0009	0.00090	0.99991	0.00090	0.00090	11111	0.00090	8.00000	396.4	0.00000	0.37	208.29	0.37	208.29
0.0010	0.00100	0.99990	0.00100	0.00100	10000	0.00100	8.00000	392.2	0.00000	0.37	228.92	0.37	228.92
0.0011	0.00110	0.99989	0.00110	0.00110	9090.9	0.00110	8.00000	388.0	0.00000	0.38	249.54	0.38	249.54
0.0012	0.00120	0.99988	0.00120	0.00120	8333.3	0.00120	8.00000	383.8	0.00000	0.38	270.17	0.38	270.17
0.0013	0.00130	0.99987	0.00130	0.00130	7692.3	0.00130	8.00000	379.6	0.00000	0.38	290.79	0.38	290.79
0.0014	0.00140	0.99986	0.00140	0.00140	7142.9	0.00140	8.00000	375.4	0.00000	0.39	311.42	0.39	311.42
0.0015	0.00150	0.99985	0.00150	0.00150	6666.7	0.00150	8.00000	371.2	0.00000	0.39	332.05	0.39	332.05
0.0016	0.00160	0.99984	0.00160	0.00160	6250.0	0.00160	8.00000	367.0	0.00000	0.39	352.67	0.39	352.67
0.0017	0.00170	0.99983	0.00170	0.00170	5925.9	0.00170	8.00000	362.8	0.00000	0.40	373.30	0.40	373.30
0.0018	0.00180	0.99982	0.00180	0.00180	5625.0	0.00180	8.00000	358.6	0.00000	0.40	393.93	0.40	393.93
0.0019	0.00190	0.99981	0.00190	0.00190	5345.0	0.00190	8.00000	354.4	0.00000	0.40	414.56	0.40	414.56
0.0020	0.00200	0.99980	0.00200	0.00200	5083.3	0.00200	8.00000	350.2	0.00000	0.41	435.18	0.41	435.18
0.0021	0.00210	0.99979	0.00210	0.00210	4838.7	0.00210	8.00000	346.0	0.00000	0.41	455.80	0.41	455.80
0.0022	0.00220	0.99978	0.00220	0.00220	4609.1	0.00220	8.00000	341.8	0.00000	0.41	476.43	0.41	476.43
0.0023	0.00230	0.99977	0.00230	0.00230	4393.0	0.00230	8.00000	337.6	0.00000	0.42	497.05	0.42	497.05
0.0024	0.00240	0.99976	0.00240	0.00240	4188.0	0.00240	8.00000	333.4	0.00000	0.42	517.68	0.42	517.68
0.0025	0.00250	0.99975	0.00250	0.00250	4000.0	0.00250	8.00000	329.2	0.00000	0.42	538.31	0.42	538.31
0.0026	0.00260	0.99974	0.00260	0.00260	3823.5	0.00260	8.00000	325.0	0.00000	0.43	558.94	0.43	558.94
0.0027	0.00270	0.99973	0.00270	0.00270	3658.0	0.00270	8.00000	320.8	0.00000	0.43	579.57	0.43	579.57
0.0028	0.00280	0.99972	0.00280	0.00280	3503.0	0.00280	8.00000	316.6	0.00000	0.44	599.20	0.44	599.20
0.0029	0.00290	0.99971	0.00290	0.00290	3358.0	0.00290	8.00000	312.4	0.00000	0.44	618.83	0.44	618.83
0.0030	0.00300	0.99970	0.00300	0.00300	3223.0	0.00300	8.00000	308.2	0.00000	0.45	638.46	0.45	638.46
0.0031	0.00310	0.99969	0.00310	0.00310	3097.0	0.00310	8.00000	304.0	0.00000	0.45	658.09	0.45	658.09
0.0032	0.00320	0.99968	0.00320	0.00320	2980.0	0.00320	8.00000	300.0	0.00000	0.46	677.72	0.46	677.72
0.0033	0.00330	0.99967	0.00330	0.00330	2872.0	0.00330	8.00000	295.8	0.00000	0.46	697.35	0.46	697.35
0.0034	0.00340	0.99966	0.00340	0.00340	2772.0	0.00340	8.00000	291.6	0.00000	0.47	716.98	0.47	716.98
0.0035	0.00350	0.99965	0.00350	0.00350	2680.0	0.00350	8.00000	287.4	0.00000	0.47	736.61	0.47	736.61
0.0036	0.00360	0.99964	0.00360	0.00360	2595.0	0.00360	8.00000	283.2	0.00000	0.48	756.24	0.48	756.24
0.0037	0.00370	0.99963	0.00370	0.00370	2517.0	0.00370	8.00000	279.0	0.00000	0.48	775.87	0.48	775.87
0.0038	0.00380	0.99962	0.00380	0.00380	2445.0	0.00380	8.00000	274.8	0.00000	0.49	795.50	0.49	795.50
0.0039	0.00390	0.99961	0.00390	0.00390	2379.0	0.00390	8.00000	270.6	0.00000	0.49	815.13	0.49	815.13
0.0040	0.00400	0.99960	0.00400	0.00400	2319.0	0.00400	8.00000	266.4	0.00000	0.50	834.76	0.50	834.76
0.0041	0.00410	0.99959	0.00410	0.00410	2264.0	0.00410	8.00000	262.2	0.00000	0.50	854.39	0.50	854.39
0.0042	0.00420	0.99958	0.00420	0.00420	2214.0	0.00420	8.00000	258.0	0.00000	0.51	874.02	0.51	874.02
0.0043	0.00430	0.99957	0.00430	0.00430	2169.0	0.00430	8.00000	253.8	0.00000	0.51	893.65	0.51	893.65
0.0044	0.00440	0.99956	0.00440	0.00440	2129.0	0.00440	8.00000	249.6	0.00000	0.52	913.28	0.52	913.28
0.0045	0.00450	0.99955	0.00450	0.00450	2093.0	0.00450	8.00000	245.4	0.00000	0.52	932.91	0.52	932.91
0.0046	0.00460	0.99954	0.00460	0.00460	2061.0	0.00460	8.00000	241.2	0.00000	0.53	952.54	0.53	952.54
0.0047	0.00470	0.99953	0.00470	0.00470	2033.0	0.00470	8.00000	237.0	0.00000	0.53	972.17	0.53	972.17
0.0048	0.00480	0.99952	0.00480	0.00480	2009.0	0.00480	8.00000	232.8	0.00000	0.54	991.80	0.54	991.80
0.0049	0.00490	0.99951	0.00490	0.00490	1989.0	0.00490	8.00000	228.6	0.00000	0.54	1011.43	0.54	1011.43
0.0050	0.00500	0.99950	0.00500	0.00500	1972.0	0.00500	8.00000	224.4	0.00000	0.55	1031.06	0.55	1031.06
0.0051	0.00510	0.99949	0.00510	0.00510	1958.0	0.00510	8.00000	220.2	0.00000	0.55	1050.69	0.55	1050.69
0.0052	0.00520	0.99948	0.00520	0.00520	1946.0	0.00520	8.00000	216.0	0.00000	0.56	1070.32	0.56	1070.32
0.0053	0.00530	0.99947	0.00530	0.00530	1936.0	0.00530	8.00000	211.8	0.00000	0.56	1089.95	0.56	1089.95
0.0054	0.00540	0.99946	0.00540	0.00540	1928.0	0.00540	8.00000	207.6	0.00000	0.57	1109.58	0.57	1109.58
0.0055	0.00550	0.99945	0.00550	0.00550	1921.0	0.00550	8.00000	203.4	0.00000	0.57	1129.21	0.57	1129.21
0.0056	0.00560	0.99944	0.00560	0.00560	1915.0	0.00560	8.00000	199.2	0.00000	0.58	1148.84	0.58	1148.84
0.0057	0.00570	0.99943	0.00570	0.00570	1910.0	0.00570	8.00000	195.0	0.00000	0.58	1168.47	0.58	1168.47
0.0058	0.00580	0.99942	0.00580	0.00580	1906.0	0.00580	8.00000	190.8	0.00000	0.59	1188.10	0.59	1188.10
0.0059	0.00590	0.99941	0.00590	0.00590	1903.0	0.00590	8.00000	186.6	0.00000	0.59	1207.73	0.59	1207.73
0.0060	0.00600	0.99940	0.00600	0.00600	1900.0	0.00600	8.00000	182.4	0.00000	0.60	1227.36	0.60	1227.36
0.0061	0.00610	0.99939	0.00610	0.00610	1898.0	0.00610	8.00000	178.2	0.00000	0.60	1246.99	0.60	1246.99
0.0062	0.00620	0.99938	0.00620	0.00620	1896.0	0.00620	8.00000	174.0	0.00000	0.61	1266.62	0.61	1266.62
0.0063	0.00630	0.99937	0.00630	0.00630	1895.0	0.00630	8.00000	169.8	0.00000	0.61	1286.25	0.61	1286.25
0.0064	0.00640	0.99936	0.00640	0.00640	1894.0	0.00640	8.00000	165.6	0.00000	0.62	1305.88	0.62	1305.88
0.0065	0.00650	0.99935	0.00650	0.00650	1894.0	0.00650	8.00000	161.4	0.00000	0.62	1325.51	0.62	1325.51
0.0066	0.00660	0.99934	0.00660	0.00660	1894.0	0.00660	8.00000	157.2	0.00000	0.63	1345.14	0.63	1345.14
0.0067	0.00670	0.99933	0.00670	0.00670	1894.0	0.00670	8.00000	153.0	0.00000	0.63	1364.77	0.63	1364.77
0.0068	0.00680	0.99932	0.00680	0.00680	1894.0	0.00680	8.00000	148.8	0.00000	0.64	1384.40	0.64	1384.40
0.0069	0.00690	0.99931	0.00690	0.00690	1894.0	0.00690	8.00000	144.6	0.00000	0.64	1404.03	0.64	1404.03
0.0070	0.00700	0.99930	0.00700	0.00700	1894.0	0.00700	8.00000	140.4	0.00000	0.65	1423.66	0.65	1423.66
0.0071	0.00710	0.99929	0.00710	0.00710	1894.0	0.00710	8.00000	136.2	0.00000	0.65	1443.29	0.65	1443.29
0.0072	0.00720	0.99928	0.00720	0.00720	1894.0	0.00720	8.00000	132.0	0.00000	0.66	1462.92	0.66	1462.92
0.0073	0.00730	0.99927	0.00730	0.00730	1894.0	0.00730	8.00000	127.8	0.00000	0.66	1482.55	0.66	1482.55
0.0074	0.00740	0.99926	0.00740	0.00740	1894.0	0.00740	8.00000	123.6	0.00000	0.67	1502.18	0.67	1502.18</

Circular Functions.

θ	$\sin \theta$	$\cos \theta$	$\tan \theta$	$\sec \theta$	$\csc \theta$	$\log \sin \theta$	$\log \cos \theta$	$\log \tan \theta$	$\log \sec \theta$	$\log \csc \theta$	θ
0.0150	0.01500	0.99988	0.01501	66.666	66.666	8.17648	9.99995	0.01501	0.01501	0.01501	0.51 33.97
0.0151	0.01510	0.99988	0.01511	66.666	66.666	8.17650	9.99995	0.01511	0.01511	0.01511	0.51 34.00
0.0152	0.01520	0.99988	0.01521	66.666	66.666	8.17652	9.99995	0.01521	0.01521	0.01521	0.51 34.03
0.0153	0.01530	0.99988	0.01531	66.666	66.666	8.17654	9.99995	0.01531	0.01531	0.01531	0.51 34.06
0.0154	0.01540	0.99988	0.01541	66.666	66.666	8.17656	9.99995	0.01541	0.01541	0.01541	0.51 34.09
0.0155	0.01550	0.99988	0.01551	66.666	66.666	8.17658	9.99995	0.01551	0.01551	0.01551	0.51 34.12
0.0156	0.01560	0.99988	0.01561	66.666	66.666	8.17660	9.99995	0.01561	0.01561	0.01561	0.51 34.15
0.0157	0.01570	0.99988	0.01571	66.666	66.666	8.17662	9.99995	0.01571	0.01571	0.01571	0.51 34.18
0.0158	0.01580	0.99988	0.01581	66.666	66.666	8.17664	9.99995	0.01581	0.01581	0.01581	0.51 34.21
0.0159	0.01590	0.99988	0.01591	66.666	66.666	8.17666	9.99995	0.01591	0.01591	0.01591	0.51 34.24
0.0160	0.01600	0.99988	0.01601	66.666	66.666	8.17668	9.99995	0.01601	0.01601	0.01601	0.51 34.27
0.0161	0.01610	0.99988	0.01611	66.666	66.666	8.17670	9.99995	0.01611	0.01611	0.01611	0.51 34.30
0.0162	0.01620	0.99988	0.01621	66.666	66.666	8.17672	9.99995	0.01621	0.01621	0.01621	0.51 34.33
0.0163	0.01630	0.99988	0.01631	66.666	66.666	8.17674	9.99995	0.01631	0.01631	0.01631	0.51 34.36
0.0164	0.01640	0.99988	0.01641	66.666	66.666	8.17676	9.99995	0.01641	0.01641	0.01641	0.51 34.39
0.0165	0.01650	0.99988	0.01651	66.666	66.666	8.17678	9.99995	0.01651	0.01651	0.01651	0.51 34.42
0.0166	0.01660	0.99988	0.01661	66.666	66.666	8.17680	9.99995	0.01661	0.01661	0.01661	0.51 34.45
0.0167	0.01670	0.99988	0.01671	66.666	66.666	8.17682	9.99995	0.01671	0.01671	0.01671	0.51 34.48
0.0168	0.01680	0.99988	0.01681	66.666	66.666	8.17684	9.99995	0.01681	0.01681	0.01681	0.51 34.51
0.0169	0.01690	0.99988	0.01691	66.666	66.666	8.17686	9.99995	0.01691	0.01691	0.01691	0.51 34.54
0.0170	0.01700	0.99988	0.01701	66.666	66.666	8.17688	9.99995	0.01701	0.01701	0.01701	0.51 34.57
0.0171	0.01710	0.99988	0.01711	66.666	66.666	8.17690	9.99995	0.01711	0.01711	0.01711	0.51 34.60
0.0172	0.01720	0.99988	0.01721	66.666	66.666	8.17692	9.99995	0.01721	0.01721	0.01721	0.51 34.63
0.0173	0.01730	0.99988	0.01731	66.666	66.666	8.17694	9.99995	0.01731	0.01731	0.01731	0.51 34.66
0.0174	0.01740	0.99988	0.01741	66.666	66.666	8.17696	9.99995	0.01741	0.01741	0.01741	0.51 34.69
0.0175	0.01750	0.99988	0.01751	66.666	66.666	8.17698	9.99995	0.01751	0.01751	0.01751	0.51 34.72
0.0176	0.01760	0.99988	0.01761	66.666	66.666	8.17700	9.99995	0.01761	0.01761	0.01761	0.51 34.75
0.0177	0.01770	0.99988	0.01771	66.666	66.666	8.17702	9.99995	0.01771	0.01771	0.01771	0.51 34.78
0.0178	0.01780	0.99988	0.01781	66.666	66.666	8.17704	9.99995	0.01781	0.01781	0.01781	0.51 34.81
0.0179	0.01790	0.99988	0.01791	66.666	66.666	8.17706	9.99995	0.01791	0.01791	0.01791	0.51 34.84
0.0180	0.01800	0.99988	0.01801	66.666	66.666	8.17708	9.99995	0.01801	0.01801	0.01801	0.51 34.87
0.0181	0.01810	0.99988	0.01811	66.666	66.666	8.17710	9.99995	0.01811	0.01811	0.01811	0.51 34.90
0.0182	0.01820	0.99988	0.01821	66.666	66.666	8.17712	9.99995	0.01821	0.01821	0.01821	0.51 34.93
0.0183	0.01830	0.99988	0.01831	66.666	66.666	8.17714	9.99995	0.01831	0.01831	0.01831	0.51 34.96
0.0184	0.01840	0.99988	0.01841	66.666	66.666	8.17716	9.99995	0.01841	0.01841	0.01841	0.51 34.99
0.0185	0.01850	0.99988	0.01851	66.666	66.666	8.17718	9.99995	0.01851	0.01851	0.01851	0.51 35.02
0.0186	0.01860	0.99988	0.01861	66.666	66.666	8.17720	9.99995	0.01861	0.01861	0.01861	0.51 35.05
0.0187	0.01870	0.99988	0.01871	66.666	66.666	8.17722	9.99995	0.01871	0.01871	0.01871	0.51 35.08
0.0188	0.01880	0.99988	0.01881	66.666	66.666	8.17724	9.99995	0.01881	0.01881	0.01881	0.51 35.11
0.0189	0.01890	0.99988	0.01891	66.666	66.666	8.17726	9.99995	0.01891	0.01891	0.01891	0.51 35.14
0.0190	0.01900	0.99988	0.01901	66.666	66.666	8.17728	9.99995	0.01901	0.01901	0.01901	0.51 35.17
0.0191	0.01910	0.99988	0.01911	66.666	66.666	8.17730	9.99995	0.01911	0.01911	0.01911	0.51 35.20
0.0192	0.01920	0.99988	0.01921	66.666	66.666	8.17732	9.99995	0.01921	0.01921	0.01921	0.51 35.23
0.0193	0.01930	0.99988	0.01931	66.666	66.666	8.17734	9.99995	0.01931	0.01931	0.01931	0.51 35.26
0.0194	0.01940	0.99988	0.01941	66.666	66.666	8.17736	9.99995	0.01941	0.01941	0.01941	0.51 35.29
0.0195	0.01950	0.99988	0.01951	66.666	66.666	8.17738	9.99995	0.01951	0.01951	0.01951	0.51 35.32
0.0196	0.01960	0.99988	0.01961	66.666	66.666	8.17740	9.99995	0.01961	0.01961	0.01961	0.51 35.35
0.0197	0.01970	0.99988	0.01971	66.666	66.666	8.17742	9.99995	0.01971	0.01971	0.01971	0.51 35.38
0.0198	0.01980	0.99988	0.01981	66.666	66.666	8.17744	9.99995	0.01981	0.01981	0.01981	0.51 35.41
0.0199	0.01990	0.99988	0.01991	66.666	66.666	8.17746	9.99995	0.01991	0.01991	0.01991	0.51 35.44
0.0200	0.02000	0.99988	0.02001	66.666	66.666	8.17748	9.99995	0.02001	0.02001	0.02001	0.51 35.47
0.0201	0.02010	0.99988	0.02011	66.666	66.666	8.17750	9.99995	0.02011	0.02011	0.02011	0.51 35.50
0.0202	0.02020	0.99988	0.02021	66.666	66.666	8.17752	9.99995	0.02021	0.02021	0.02021	0.51 35.53
0.0203	0.02030	0.99988	0.02031	66.666	66.666	8.17754	9.99995	0.02031	0.02031	0.02031	0.51 35.56
0.0204	0.02040	0.99988	0.02041	66.666	66.666	8.17756	9.99995	0.02041	0.02041	0.02041	0.51 35.59
0.0205	0.02050	0.99988	0.02051	66.666	66.666	8.17758	9.99995	0.02051	0.02051	0.02051	0.51 35.62
0.0206	0.02060	0.99988	0.02061	66.666	66.666	8.17760	9.99995	0.02061	0.02061	0.02061	0.51 35.65
0.0207	0.02070	0.99988	0.02071	66.666	66.666	8.17762	9.99995	0.02071	0.02071	0.02071	0.51 35.68
0.0208	0.02080	0.99988	0.02081	66.666	66.666	8.17764	9.99995	0.02081	0.02081	0.02081	0.51 35.71
0.0209	0.02090	0.99988	0.02091	66.666	66.666	8.17766	9.99995	0.02091	0.02091	0.02091	0.51 35.74
0.0210	0.02100	0.99988	0.02101	66.666	66.666	8.17768	9.99995	0.02101	0.02101	0.02101	0.51 35.77
0.0211	0.02110	0.99988	0.02111	66.666	66.666	8.17770	9.99995	0.02111	0.02111	0.02111	0.51 35.80
0.0212	0.02120	0.99988	0.02121	66.666	66.666	8.17772	9.99995	0.02121	0.02121	0.02121	0.51 35.83
0.0213	0.02130	0.99988	0.02131	66.666	66.666	8.17774	9.99995	0.02131	0.02131	0.02131	0.51 35.86
0.0214	0.02140	0.99988	0.02141	66.666	66.666	8.17776	9.99995	0.02141	0.02141	0.02141	0.51 35.89
0.0215	0.02150	0.99988	0.02151	66.666	66.666	8.17778	9.99995	0.02151	0.02151	0.02151	0.51 35.92
0.0216	0.02160	0.99988	0.02161	66.666	66.666	8.17780	9.99995	0.02161	0.02161	0.02161	0.51 35.95
0.0217	0.02170	0.99988	0.02171	66.666	66.666	8.17782	9.99995	0.02171	0.02171	0.02171	0.51 35.98
0.0218	0.02180	0.99988	0.02181	66.666	66.666	8.17784	9.99995	0.02181	0.02181	0.02181	0.51 36.01
0.0219	0.02190	0.99988	0.02191	66.666	66.666	8.17786	9.99995	0.02191	0.02191	0.02191	0.51 36.04
0.0220	0.02200	0.99988	0.02201	66.666	66.666	8.17788	9.99995	0.02201	0.02201	0.02201	0.51 36.07
0.0221	0.02210	0.99988	0.02211	66.666	66.666	8.17790	9.99995	0.02211	0.02211	0.02211	0.51 36.10
0.0222	0.02220	0.99988	0.02221	66.666	66.666	8.17792	9.99995	0.02221	0.02221	0.02221	0.51 36.13
0.0223	0.02230	0.99988	0.02231	66.666	66.666	8.17794	9.99995	0.02231	0.02231	0.02231	0.51 36.16
0.0224	0.02240	0.99988	0.02241	66.666	66.666	8.17796	9.99995	0.02241	0.02241	0.02241	0.51 36.19
0.0225	0.02250	0.99988	0.02251	66.666	66.666	8.17798	9.99995	0.02251	0.02251	0.02251	0.51 36.22
0.0226	0.02260	0.99988	0.02261	66.666	66.666	8.17800	9.99995	0.02261	0.02261	0.02261	0.51 36.25
0.0227	0.02270	0.99988	0.02271	66.666	66.666	8.17802	9.99995	0.02271	0.02271	0.02271	0.51 36.28
0.0228	0.02280	0.99988	0.02281	66.666	66.666	8.17804	9.99995	0.02281	0.02281	0.02281	0.51 36.31
0.0229	0.02290	0.99988	0.02291	66.666	66.666	8.17806	9.99995	0.02291	0.02291	0.02291	0.51 36.34
0.0230	0.02300	0.99988	0.02301	66.666	66.666	8.17808	9.99995	0.02301	0.02301	0.02301	0.51 36.37
0.0231	0.02310	0.99988	0.02311	66.666	66.666	8.17810	9.99995				

Circular Functions.

u	$\sin u$	$= F_1'$	$\cos u$	$= F_2'$	$\log \sin u$	$= F_3'$	$\log \cos u$	$= F_4'$	u
0.0000	0.00000	10.00	0.99980	0.2	8.30100	217.1	0.99999	0.1	1 05 45.30
.0001	.00010		.99980		.30317	216.0	.99999		1 05 05.97
.0002	.00020		.99980		.30532	215.0	.99999		1 05 26.55
.0003	.00030		.99979		.30747	214.0	.99999		1 05 47.18
.0004	.00040		.99979		.30960	213.0	.99999		1 06 07.80
0.0005	0.00050	10.00	0.99979	0.2	8.31172	211.8	0.99999	0.1	1 10 28.43
.0006	.00060		.99979		.31384	210.8	.99999		1 10 49.00
.0007	.00070		.99979		.31594	209.8	.99999		1 11 09.68
.0008	.00080		.99978		.31803	208.8	.99999		1 11 30.31
.0009	.00090		.99978		.32012	207.8	.99999		1 11 50.93
0.0010	0.00100	10.00	0.99978	0.2	8.32219	206.8	0.99999	0.1	1 12 11.56
.0011	.00110		.99978		.32425	205.8	.99999		1 12 32.19
.0012	.00120		.99978		.32630	204.8	.99999		1 12 52.81
.0013	.00130		.99977		.32835	203.0	.99999		1 13 13.44
.0014	.00140		.99977		.33038	202.0	.99999		1 13 34.07
0.0015	0.00150	10.00	0.99977	0.2	8.33241	201.0	0.99999	0.1	1 13 54.69
.0016	.00160		.99977		.33442	200.0	.99999		1 14 15.32
.0017	.00170		.99976		.33643	200.1	.99999		1 14 35.95
.0018	.00180		.99976		.33842	199.2	.99999		1 14 56.57
.0019	.00190		.99976		.34041	198.3	.99999		1 15 17.20
0.0020	0.00200	10.00	0.99976	0.2	8.34239	197.4	0.99999	0.1	1 15 37.83
.0021	.00210		.99976		.34436	196.5	.99999		1 15 58.45
.0022	.00220		.99975		.34632	195.6	.99999		1 16 19.08
.0023	.00230		.99975		.34827	194.7	.99999		1 16 39.71
.0024	.00240		.99975		.35021	193.8	.99999		1 17 00.33
0.0025	0.00250	10.00	0.99975	0.2	8.35215	193.0	0.99999	0.1	1 17 20.96
.0026	.00260		.99974		.35407	192.1	.99999		1 17 41.58
.0027	.00270		.99974		.35599	191.3	.99999		1 18 02.21
.0028	.00280		.99974		.35790	190.4	.99999		1 18 22.84
.0029	.00290		.99974		.35980	189.6	.99999		1 18 43.46
0.0030	0.00300	10.00	0.99974	0.2	8.36160	188.8	0.99999	0.1	1 19 04.09
.0031	.00310		.99973		.36357	188.0	.99999		1 19 24.72
.0032	.00320		.99973		.36545	187.2	.99999		1 19 45.34
.0033	.00330		.99973		.36732	186.4	.99999		1 20 05.97
.0034	.00340		.99973		.36918	185.6	.99999		1 20 26.60
0.0035	0.00350	10.00	0.99972	0.2	8.37103	184.8	0.99999	0.1	1 20 47.22
.0036	.00360		.99972		.37287	184.0	.99999		1 21 07.85
.0037	.00370		.99972		.37471	183.2	.99999		1 21 28.48
.0038	.00380		.99972		.37654	182.4	.99999		1 21 49.10
.0039	.00390		.99971		.37836	181.7	.99999		1 22 09.73
0.0040	0.00400	10.00	0.99971	0.2	8.38017	180.9	0.99999	0.1	1 22 30.36
.0041	.00410		.99971		.38198	180.2	.99999		1 22 50.98
.0042	.00420		.99971		.38377	179.4	.99999		1 23 11.61
.0043	.00430		.99970		.38556	178.7	.99999		1 23 32.23
.0044	.00440		.99970		.38735	178.0	.99999		1 23 52.86
0.0045	0.00450	10.00	0.99970	0.2	8.38912	177.2	0.99999	0.1	1 24 13.49
.0046	.00460		.99970		.38989	176.5	.99999		1 24 34.11
.0047	.00470		.99969		.39065	175.8	.99999		1 24 54.74
.0048	.00480		.99969		.39241	175.1	.99999		1 25 15.37
.0049	.00490		.99969		.39415	174.4	.99999		1 25 35.99
0.0050	0.00500	10.00	0.99969	0.2	8.39789	173.7	0.99999	0.1	1 25 56.62
u	$-\sin u$	$= F_1'$	$\cos u$	$= F_2'$	$\log \frac{\sin u}{u}$	$= F_3'$	$\log \frac{\cos u}{u}$	$= F_4'$	u

Circular Functions.

x	$\sin x$	$\cos x$	$\tan x$	$\cot x$	$\sec x$	$\csc x$	$\log \sin x$	$\log \cos x$	$\log \tan x$	$\log \cot x$	$\log \sec x$	$\log \csc x$
0.0250	0.02500	0.99969	0.2	5.0	1.00031	1.00000	8.39789	173.7	9.99986	0.1	1.25 56.62	1.25 56.62
0.0251	0.02510	0.99969	0.2	5.0	1.00031	1.00000	8.39793	173.0	9.99986	1.25 17.25	1.25 17.25	1.25 17.25
0.0252	0.02520	0.99968	0.2	5.0	1.00031	1.00000	8.39797	172.3	9.99986	1.25 37.87	1.25 37.87	1.25 37.87
0.0253	0.02530	0.99968	0.2	5.0	1.00031	1.00000	8.39801	171.6	9.99986	1.25 58.50	1.25 58.50	1.25 58.50
0.0254	0.02540	0.99968	0.2	5.0	1.00031	1.00000	8.39805	170.9	9.99986	1.25 79.13	1.25 79.13	1.25 79.13
0.0255	0.02550	0.99967	0.2	5.0	1.00031	1.00000	8.39809	170.2	9.99986	1.25 99.75	1.25 99.75	1.25 99.75
0.0256	0.02560	0.99967	0.2	5.0	1.00031	1.00000	8.39813	169.5	9.99986	1.25 120.38	1.25 120.38	1.25 120.38
0.0257	0.02570	0.99967	0.2	5.0	1.00031	1.00000	8.39817	168.8	9.99986	1.25 141.01	1.25 141.01	1.25 141.01
0.0258	0.02580	0.99967	0.2	5.0	1.00031	1.00000	8.39821	168.1	9.99986	1.25 161.63	1.25 161.63	1.25 161.63
0.0259	0.02590	0.99966	0.2	5.0	1.00031	1.00000	8.39825	167.4	9.99986	1.25 182.26	1.25 182.26	1.25 182.26
0.0260	0.02600	0.99966	0.2	5.0	1.00031	1.00000	8.39829	166.7	9.99986	1.25 202.88	1.25 202.88	1.25 202.88
0.0261	0.02610	0.99966	0.2	5.0	1.00031	1.00000	8.39833	166.0	9.99986	1.25 223.51	1.25 223.51	1.25 223.51
0.0262	0.02620	0.99966	0.2	5.0	1.00031	1.00000	8.39837	165.3	9.99986	1.25 244.14	1.25 244.14	1.25 244.14
0.0263	0.02630	0.99966	0.2	5.0	1.00031	1.00000	8.39841	164.6	9.99986	1.25 264.76	1.25 264.76	1.25 264.76
0.0264	0.02640	0.99966	0.2	5.0	1.00031	1.00000	8.39845	163.9	9.99986	1.25 285.39	1.25 285.39	1.25 285.39
0.0265	0.02650	0.99965	0.2	5.0	1.00031	1.00000	8.39849	163.2	9.99986	1.25 306.02	1.25 306.02	1.25 306.02
0.0266	0.02660	0.99965	0.2	5.0	1.00031	1.00000	8.39853	162.5	9.99986	1.25 326.64	1.25 326.64	1.25 326.64
0.0267	0.02670	0.99965	0.2	5.0	1.00031	1.00000	8.39857	161.8	9.99986	1.25 347.27	1.25 347.27	1.25 347.27
0.0268	0.02680	0.99965	0.2	5.0	1.00031	1.00000	8.39861	161.1	9.99986	1.25 367.90	1.25 367.90	1.25 367.90
0.0269	0.02690	0.99965	0.2	5.0	1.00031	1.00000	8.39865	160.4	9.99986	1.25 388.52	1.25 388.52	1.25 388.52
0.0270	0.02700	0.99964	0.2	5.0	1.00031	1.00000	8.39869	159.7	9.99986	1.25 409.15	1.25 409.15	1.25 409.15
0.0271	0.02710	0.99964	0.2	5.0	1.00031	1.00000	8.39873	159.0	9.99986	1.25 429.78	1.25 429.78	1.25 429.78
0.0272	0.02720	0.99964	0.2	5.0	1.00031	1.00000	8.39877	158.3	9.99986	1.25 450.40	1.25 450.40	1.25 450.40
0.0273	0.02730	0.99964	0.2	5.0	1.00031	1.00000	8.39881	157.6	9.99986	1.25 471.03	1.25 471.03	1.25 471.03
0.0274	0.02740	0.99964	0.2	5.0	1.00031	1.00000	8.39885	156.9	9.99986	1.25 491.66	1.25 491.66	1.25 491.66
0.0275	0.02750	0.99963	0.2	5.0	1.00031	1.00000	8.39889	156.2	9.99986	1.25 512.28	1.25 512.28	1.25 512.28
0.0276	0.02760	0.99963	0.2	5.0	1.00031	1.00000	8.39893	155.5	9.99986	1.25 532.91	1.25 532.91	1.25 532.91
0.0277	0.02770	0.99963	0.2	5.0	1.00031	1.00000	8.39897	154.8	9.99986	1.25 553.54	1.25 553.54	1.25 553.54
0.0278	0.02780	0.99963	0.2	5.0	1.00031	1.00000	8.39901	154.1	9.99986	1.25 574.16	1.25 574.16	1.25 574.16
0.0279	0.02790	0.99963	0.2	5.0	1.00031	1.00000	8.39905	153.4	9.99986	1.25 594.79	1.25 594.79	1.25 594.79
0.0280	0.02800	0.99962	0.2	5.0	1.00031	1.00000	8.39909	152.7	9.99986	1.25 615.41	1.25 615.41	1.25 615.41
0.0281	0.02810	0.99962	0.2	5.0	1.00031	1.00000	8.39913	152.0	9.99986	1.25 636.04	1.25 636.04	1.25 636.04
0.0282	0.02820	0.99962	0.2	5.0	1.00031	1.00000	8.39917	151.3	9.99986	1.25 656.67	1.25 656.67	1.25 656.67
0.0283	0.02830	0.99962	0.2	5.0	1.00031	1.00000	8.39921	150.6	9.99986	1.25 677.29	1.25 677.29	1.25 677.29
0.0284	0.02840	0.99962	0.2	5.0	1.00031	1.00000	8.39925	149.9	9.99986	1.25 697.92	1.25 697.92	1.25 697.92
0.0285	0.02850	0.99961	0.2	5.0	1.00031	1.00000	8.39929	149.2	9.99986	1.25 718.55	1.25 718.55	1.25 718.55
0.0286	0.02860	0.99961	0.2	5.0	1.00031	1.00000	8.39933	148.5	9.99986	1.25 739.17	1.25 739.17	1.25 739.17
0.0287	0.02870	0.99961	0.2	5.0	1.00031	1.00000	8.39937	147.8	9.99986	1.25 759.80	1.25 759.80	1.25 759.80
0.0288	0.02880	0.99961	0.2	5.0	1.00031	1.00000	8.39941	147.1	9.99986	1.25 780.43	1.25 780.43	1.25 780.43
0.0289	0.02890	0.99961	0.2	5.0	1.00031	1.00000	8.39945	146.4	9.99986	1.25 801.05	1.25 801.05	1.25 801.05
0.0290	0.02900	0.99960	0.2	5.0	1.00031	1.00000	8.39949	145.7	9.99986	1.25 821.68	1.25 821.68	1.25 821.68
0.0291	0.02910	0.99960	0.2	5.0	1.00031	1.00000	8.39953	145.0	9.99986	1.25 842.31	1.25 842.31	1.25 842.31
0.0292	0.02920	0.99960	0.2	5.0	1.00031	1.00000	8.39957	144.3	9.99986	1.25 862.93	1.25 862.93	1.25 862.93
0.0293	0.02930	0.99960	0.2	5.0	1.00031	1.00000	8.39961	143.6	9.99986	1.25 883.56	1.25 883.56	1.25 883.56
0.0294	0.02940	0.99960	0.2	5.0	1.00031	1.00000	8.39965	142.9	9.99986	1.25 904.19	1.25 904.19	1.25 904.19
0.0295	0.02950	0.99959	0.2	5.0	1.00031	1.00000	8.39969	142.2	9.99986	1.25 924.81	1.25 924.81	1.25 924.81
0.0296	0.02960	0.99959	0.2	5.0	1.00031	1.00000	8.39973	141.5	9.99986	1.25 945.44	1.25 945.44	1.25 945.44
0.0297	0.02970	0.99959	0.2	5.0	1.00031	1.00000	8.39977	140.8	9.99986	1.25 966.06	1.25 966.06	1.25 966.06
0.0298	0.02980	0.99959	0.2	5.0	1.00031	1.00000	8.39981	140.1	9.99986	1.25 986.69	1.25 986.69	1.25 986.69
0.0299	0.02990	0.99959	0.2	5.0	1.00031	1.00000	8.39985	139.4	9.99986	1.25 1007.32	1.25 1007.32	1.25 1007.32
0.0300	0.03000	0.99958	0.2	5.0	1.00031	1.00000	8.39989	138.7	9.99986	1.25 1027.94	1.25 1027.94	1.25 1027.94
x	$-\sin x$	$\cos x$	$\tan x$	$\cot x$	$\sec x$	$\csc x$	$\log \sin x$	$\log \cos x$	$\log \tan x$	$\log \cot x$	$\log \sec x$	$\log \csc x$

Circular Functions.

u	$\sin u$	$= F_1'$	$\cos u$	$= F_2'$	$\log \sin u$	$= F_3'$	$\log \cos u$	$= F_4'$	u
0.0300	0.03000	10.0	0.99955	0.3	8.47705	144.7	9.99980	0.1	1 43 07.04
0.0301	0.03010		0.99955		47859	144.2	9.99980		1 43 28.57
0.0302	0.03020		0.99954		47904	143.8	9.99980		1 43 49.20
0.0303	0.03030		0.99954		48138	143.3	9.99980		1 44 09.82
0.0304	0.03040		0.99954		48381	142.8	9.99980		1 44 30.45
0.0305	0.03050	10.0	0.99953	0.3	8.48223	142.3	9.99980	0.1	1 44 51.08
0.0306	0.03060		0.99953		48595	141.9	9.99980		1 45 11.70
0.0307	0.03070		0.99953		48707	141.4	9.99980		1 45 32.33
0.0308	0.03080		0.99953		48848	141.0	9.99979		1 45 52.96
0.0309	0.03090		0.99953		48989	140.5	9.99979		1 46 13.58
0.0310	0.03100	10.0	0.99952	0.3	8.49189	140.1	9.99979	0.1	1 46 34.21
0.0311	0.03109		0.99952		49409	139.6	9.99979		1 46 54.84
0.0312	0.03119		0.99951		49408	139.2	9.99979		1 47 15.46
0.0313	0.03120		0.99951		49547	138.7	9.99979		1 47 36.09
0.0314	0.03130		0.99951		49689	138.3	9.99979		1 47 56.71
0.0315	0.03140	10.0	0.99950	0.3	8.49824	137.8	9.99978	0.1	1 48 17.34
0.0316	0.03150		0.99950		49961	137.4	9.99978		1 48 37.97
0.0317	0.03160		0.99949		50099	137.0	9.99978		1 48 58.59
0.0318	0.03170		0.99949		50235	136.5	9.99978		1 49 19.22
0.0319	0.03180		0.99949		50372	136.1	9.99978		1 49 39.85
0.0320	0.03190	10.0	0.99949	0.3	8.50508	135.7	9.99978	0.1	1 50 00.47
0.0321	0.03200		0.99948		50643	135.2	9.99978		1 50 21.10
0.0322	0.03210		0.99948		50778	134.8	9.99977		1 50 41.73
0.0323	0.03220		0.99948		50913	134.4	9.99977		1 51 02.35
0.0324	0.03230		0.99948		51047	134.0	9.99977		1 51 22.98
0.0325	0.03240	10.0	0.99947	0.3	8.51181	133.6	9.99977	0.1	1 51 43.61
0.0326	0.03250		0.99947		51314	133.2	9.99977		1 52 04.24
0.0327	0.03260		0.99947		51447	132.8	9.99977		1 52 24.86
0.0328	0.03270		0.99946		51580	132.4	9.99977		1 52 45.49
0.0329	0.03280		0.99946		51712	132.0	9.99976		1 53 06.11
0.0330	0.03290	10.0	0.99946	0.3	8.51844	131.6	9.99976	0.1	1 53 26.74
0.0331	0.03300		0.99945		51975	131.2	9.99976		1 53 47.37
0.0332	0.03310		0.99945		52106	130.8	9.99976		1 54 07.99
0.0333	0.03320		0.99945		52236	130.4	9.99976		1 54 28.62
0.0334	0.03330		0.99944		52367	130.0	9.99976		1 54 49.24
0.0335	0.03340	10.0	0.99944	0.3	8.52406	129.6	9.99976	0.1	1 55 09.87
0.0336	0.03350		0.99944		52606	129.2	9.99975		1 55 30.50
0.0337	0.03360		0.99943		52735	128.8	9.99975		1 55 51.12
0.0338	0.03370		0.99943		52863	128.4	9.99975		1 56 11.75
0.0339	0.03380		0.99943		53012	128.1	9.99975		1 56 32.38
0.0340	0.03390	10.0	0.99942	0.3	8.53140	127.7	9.99975	0.1	1 56 53.00
0.0341	0.03400		0.99942		53269	127.3	9.99975		1 57 13.63
0.0342	0.03410		0.99942		53394	126.9	9.99975		1 57 34.26
0.0343	0.03420		0.99941		53521	126.6	9.99974		1 57 54.88
0.0344	0.03430		0.99941		53647	126.2	9.99974		1 58 15.51
0.0345	0.03440	10.0	0.99940	0.3	8.53773	125.8	9.99974	0.1	1 58 36.14
0.0346	0.03450		0.99940		53899	125.5	9.99974	0.2	1 58 56.76
0.0347	0.03460		0.99940		54044	125.1	9.99974		1 59 17.39
0.0348	0.03470		0.99939		54189	124.7	9.99974		1 59 38.02
0.0349	0.03480		0.99939		54274	124.4	9.99974		1 59 58.64
0.0350	0.03490	10.0	0.99939	0.3	8.54398	124.0	9.99973	0.2	2 00 19.27
x	$-\frac{1}{2} \sinh x$	$= F_1'$	$\cosh x$	$= F_2'$	$\log \frac{\sinh x}{x}$	$= F_3'$	$\log \cosh x$	$= F_4'$	x

SMITHSONIAN TABLES

Circular Functions.

u	$\sin u$	$= F_1'$	$\cos u$	$= F_2'$	$\log \sin u$	$= F_3'$	$\log \cos u$	$= F_4'$	π
0.0000	0.00000	10.00	0.99999	0.0	8.54288	1.210	9.00000	0.2	2 00 19.27
0.001	0.00099		0.99985	0.0	8.54288	1.210	9.00000	0.2	2 00 39.82
0.002	0.00198		0.99970	0.0	8.54288	1.210	9.00000	0.2	2 01 00.37
0.003	0.00297		0.99955	0.0	8.54288	1.210	9.00000	0.2	2 01 21.15
0.004	0.00396		0.99940	0.0	8.54288	1.210	9.00000	0.2	2 01 41.77
0.005	0.00495		0.99925	0.0	8.54288	1.210	9.00000	0.2	2 02 02.40
0.006	0.00594		0.99910	0.0	8.54288	1.210	9.00000	0.2	2 02 23.03
0.007	0.00693		0.99895	0.0	8.54288	1.210	9.00000	0.2	2 02 43.66
0.008	0.00792		0.99880	0.0	8.54288	1.210	9.00000	0.2	2 03 04.28
0.009	0.00891		0.99865	0.0	8.54288	1.210	9.00000	0.2	2 03 24.91
0.010	0.00990	10.01	0.99850	0.0	8.54288	1.210	9.00000	0.2	2 03 45.53
0.011	0.01089		0.99835	0.0	8.54288	1.210	9.00000	0.2	2 04 06.16
0.012	0.01188		0.99820	0.0	8.54288	1.210	9.00000	0.2	2 04 26.79
0.013	0.01287		0.99805	0.0	8.54288	1.210	9.00000	0.2	2 04 47.41
0.014	0.01386		0.99790	0.0	8.54288	1.210	9.00000	0.2	2 05 08.03
0.015	0.01485	10.01	0.99775	0.0	8.54288	1.210	9.00000	0.2	2 05 28.67
0.016	0.01584		0.99760	0.0	8.54288	1.210	9.00000	0.2	2 05 49.29
0.017	0.01683		0.99745	0.0	8.54288	1.210	9.00000	0.2	2 06 09.92
0.018	0.01782		0.99730	0.0	8.54288	1.210	9.00000	0.2	2 06 30.54
0.019	0.01881		0.99715	0.0	8.54288	1.210	9.00000	0.2	2 06 51.17
0.020	0.01980	10.01	0.99700	0.0	8.54288	1.210	9.00000	0.2	2 07 11.80
0.021	0.02079		0.99685	0.0	8.54288	1.210	9.00000	0.2	2 07 32.42
0.022	0.02178		0.99670	0.0	8.54288	1.210	9.00000	0.2	2 07 53.05
0.023	0.02277		0.99655	0.0	8.54288	1.210	9.00000	0.2	2 08 13.68
0.024	0.02376		0.99640	0.0	8.54288	1.210	9.00000	0.2	2 08 34.30
0.025	0.02475	10.01	0.99625	0.0	8.54288	1.210	9.00000	0.2	2 08 54.93
0.026	0.02574		0.99610	0.0	8.54288	1.210	9.00000	0.2	2 09 15.56
0.027	0.02673		0.99595	0.0	8.54288	1.210	9.00000	0.2	2 09 36.18
0.028	0.02772		0.99580	0.0	8.54288	1.210	9.00000	0.2	2 09 56.81
0.029	0.02871		0.99565	0.0	8.54288	1.210	9.00000	0.2	2 10 17.44
0.030	0.02970	10.01	0.99550	0.0	8.54288	1.210	9.00000	0.2	2 10 38.06
0.031	0.03069		0.99535	0.0	8.54288	1.210	9.00000	0.2	2 10 58.69
0.032	0.03168		0.99520	0.0	8.54288	1.210	9.00000	0.2	2 11 19.32
0.033	0.03267		0.99505	0.0	8.54288	1.210	9.00000	0.2	2 11 39.94
0.034	0.03366		0.99490	0.0	8.54288	1.210	9.00000	0.2	2 12 00.57
0.035	0.03465	10.01	0.99475	0.0	8.54288	1.210	9.00000	0.2	2 12 21.20
0.036	0.03564		0.99460	0.0	8.54288	1.210	9.00000	0.2	2 12 41.82
0.037	0.03663		0.99445	0.0	8.54288	1.210	9.00000	0.2	2 13 02.45
0.038	0.03762		0.99430	0.0	8.54288	1.210	9.00000	0.2	2 13 23.07
0.039	0.03861		0.99415	0.0	8.54288	1.210	9.00000	0.2	2 13 43.70
0.040	0.03960	10.01	0.99400	0.0	8.54288	1.210	9.00000	0.2	2 14 04.33
0.041	0.04059		0.99385	0.0	8.54288	1.210	9.00000	0.2	2 14 24.95
0.042	0.04158		0.99370	0.0	8.54288	1.210	9.00000	0.2	2 14 45.58
0.043	0.04257		0.99355	0.0	8.54288	1.210	9.00000	0.2	2 15 06.21
0.044	0.04356		0.99340	0.0	8.54288	1.210	9.00000	0.2	2 15 26.83
0.045	0.04455	10.01	0.99325	0.0	8.54288	1.210	9.00000	0.2	2 15 47.46
0.046	0.04554		0.99310	0.0	8.54288	1.210	9.00000	0.2	2 16 08.09
0.047	0.04653		0.99295	0.0	8.54288	1.210	9.00000	0.2	2 16 28.71
0.048	0.04752		0.99280	0.0	8.54288	1.210	9.00000	0.2	2 16 49.34
0.049	0.04851		0.99265	0.0	8.54288	1.210	9.00000	0.2	2 17 09.97
0.050	0.04950	10.01	0.99250	0.0	8.54288	1.210	9.00000	0.2	2 17 30.59
u	$-\sin u$	$= F_1'$	$-\cos u$	$= F_2'$	$\log \sin u$	$= F_3'$	$\log \cos u$	$= F_4'$	π

Circular Functions.

u	$\sin u$	$= F_1'$	$\cos u$	$= F_2'$	$\log \sin u$	$= F_3'$	$\log \cos u$	$= F_4'$	u
0.0100	0.01000	10.0	0.99990	0.1	8.60194	108.5	9.00005	0.2	2 17 30.89
0.0101	0.01000		0.99990		8.60303	108.2	9.00005		2 17 51.22
0.0102	0.01010		0.99990		8.60411	108.0	9.00005		2 18 11.85
0.0103	0.01020		0.99990		8.60519	107.7	9.00005		2 18 32.47
0.0104	0.01030		0.99990		8.60626	107.4	9.00005		2 18 53.10
0.0105	0.01040	10.0	0.99990	0.4	8.60734	107.2	9.00005	0.2	2 19 13.72
0.0106	0.01050		0.99990		8.60841	106.9	9.00005		2 19 34.35
0.0107	0.01060		0.99990		8.60947	106.6	9.00005		2 19 54.98
0.0108	0.01070		0.99990		8.61054	106.4	9.00005		2 20 15.60
0.0109	0.01080		0.99990		8.61160	106.1	9.00005		2 20 36.23
0.0110	0.01090	10.0	0.99990	0.4	8.61265	105.9	9.00005	0.2	2 20 56.86
0.0111	0.01100		0.99990		8.61374	105.6	9.00005		2 21 17.48
0.0112	0.01110		0.99990		8.61477	105.4	9.00005		2 21 38.11
0.0113	0.01120		0.99990		8.61581	105.1	9.00005		2 21 58.74
0.0114	0.01130		0.99990		8.61688	104.8	9.00005		2 22 19.36
0.0115	0.01140	10.0	0.99990	0.4	8.61792	104.6	9.00005	0.2	2 22 39.99
0.0116	0.01150		0.99990		8.61897	104.3	9.00005		2 23 00.62
0.0117	0.01160		0.99990		8.62001	104.1	9.00005		2 23 21.24
0.0118	0.01170		0.99990		8.62105	103.8	9.00005		2 23 41.87
0.0119	0.01180		0.99990		8.62209	103.6	9.00005		2 24 02.50
0.0120	0.01190	10.0	0.99990	0.4	8.62312	103.3	9.00005	0.2	2 24 23.12
0.0121	0.01200		0.99990		8.62413	103.1	9.00005		2 24 43.75
0.0122	0.01210		0.99990		8.62518	102.9	9.00005		2 25 04.37
0.0123	0.01220		0.99990		8.62621	102.6	9.00005		2 25 25.00
0.0124	0.01230		0.99990		8.62724	102.4	9.00005		2 25 45.63
0.0125	0.01240	10.0	0.99990	0.4	8.62826	102.1	9.00005	0.2	2 26 06.25
0.0126	0.01250		0.99990		8.62928	101.9	9.00005		2 26 26.88
0.0127	0.01260		0.99990		8.63030	101.6	9.00005		2 26 47.51
0.0128	0.01270		0.99990		8.63131	101.4	9.00005		2 27 08.13
0.0129	0.01280		0.99990		8.63232	101.2	9.00005		2 27 28.76
0.0130	0.01290	10.0	0.99990	0.4	8.63333	100.9	9.00005	0.2	2 27 49.39
0.0131	0.01300		0.99990		8.63434	100.7	9.00005		2 28 10.01
0.0132	0.01310		0.99990		8.63535	100.5	9.00005		2 28 30.64
0.0133	0.01320		0.99990		8.63635	100.2	9.00005		2 28 51.27
0.0134	0.01330		0.99990		8.63735	100.0	9.00005		2 29 11.89
0.0135	0.01340	10.0	0.99990	0.4	8.63835	99.8	9.00005	0.2	2 29 32.52
0.0136	0.01350		0.99990		8.63935	99.5	9.00005		2 29 53.15
0.0137	0.01360		0.99990		8.64034	99.3	9.00005		2 30 13.77
0.0138	0.01370		0.99990		8.64134	99.1	9.00005		2 30 34.40
0.0139	0.01380		0.99990		8.64233	98.9	9.00005		2 30 55.02
0.0140	0.01390	10.0	0.99990	0.4	8.64331	98.6	9.00005	0.2	2 31 15.65
0.0141	0.01400		0.99990		8.64430	98.4	9.00005		2 31 36.28
0.0142	0.01410		0.99990		8.64528	98.2	9.00005		2 31 56.90
0.0143	0.01420		0.99990		8.64626	98.0	9.00005		2 32 17.53
0.0144	0.01430		0.99990		8.64724	97.7	9.00005		2 32 38.16
0.0145	0.01440	10.0	0.99990	0.4	8.64822	97.5	9.00005	0.2	2 32 58.78
0.0146	0.01450		0.99990		8.64919	97.3	9.00005		2 33 19.41
0.0147	0.01460		0.99990		8.65016	97.1	9.00005		2 33 40.04
0.0148	0.01470		0.99990		8.65113	96.9	9.00005		2 34 00.66
0.0149	0.01480		0.99990		8.65210	96.7	9.00005		2 34 21.29
0.0150	0.01490	10.0	0.99990	0.4	8.65307	96.4	9.00005	0.2	2 34 41.92
u	$-\sin u$	$= F_1'$	$\cos u$	$= F_2'$	$\log \sin u$	$= F_3'$	$\log \cos u$	$= F_4'$	u

Circular Functions

n	$\sin \alpha$	$\approx F_1'$	$\cos \alpha$	$\approx F_2'$	$\log \sin \alpha$	$\approx F_3'$	$\log \cos \alpha$	$\approx F_4'$	q
0.0399	0.0399	0.04	0.9998	0.1	8.60307	9.64	9.99995	0.2	2 34 41.59
0.0401	0.0401		0.9998	0.5	8.60317	9.64	9.99995		2 35 02.51
0.0403	0.0403		0.9998		8.60327	9.64	9.99995		2 35 23.47
0.0405	0.0405		0.9998		8.60337	9.64	9.99995		2 35 44.38
0.0407	0.0407		0.9998		8.60347	9.64	9.99995		2 36 05.29
0.0409	0.0409		0.9998		8.60357	9.64	9.99995		2 36 26.25
0.0411	0.0411		0.9998		8.60367	9.64	9.99995		2 36 47.18
0.0413	0.0413		0.9998		8.60377	9.64	9.99995		2 37 08.10
0.0415	0.0415		0.9998		8.60387	9.64	9.99995		2 37 29.03
0.0417	0.0417		0.9998		8.60397	9.64	9.99995		2 37 50.00
0.0419	0.0419		0.9998		8.60407	9.64	9.99995		2 38 10.98
0.0421	0.0421		0.9998		8.60417	9.64	9.99995		2 38 31.98
0.0423	0.0423		0.9998		8.60427	9.64	9.99995		2 38 52.98
0.0425	0.0425		0.9998		8.60437	9.64	9.99995		2 39 13.98
0.0427	0.0427		0.9998		8.60447	9.64	9.99995		2 39 34.98
0.0429	0.0429		0.9998		8.60457	9.64	9.99995		2 39 55.98
0.0431	0.0431		0.9998		8.60467	9.64	9.99995		2 40 16.98
0.0433	0.0433		0.9998		8.60477	9.64	9.99995		2 40 37.98
0.0435	0.0435		0.9998		8.60487	9.64	9.99995		2 40 58.98
0.0437	0.0437		0.9998		8.60497	9.64	9.99995		2 41 19.98
0.0439	0.0439		0.9998		8.60507	9.64	9.99995		2 41 40.98
0.0441	0.0441		0.9998		8.60517	9.64	9.99995		2 42 01.98
0.0443	0.0443		0.9998		8.60527	9.64	9.99995		2 42 22.98
0.0445	0.0445		0.9998		8.60537	9.64	9.99995		2 42 43.98
0.0447	0.0447		0.9998		8.60547	9.64	9.99995		2 43 04.98
0.0449	0.0449		0.9998		8.60557	9.64	9.99995		2 43 25.98
0.0451	0.0451		0.9998		8.60567	9.64	9.99995		2 43 46.98
0.0453	0.0453		0.9998		8.60577	9.64	9.99995		2 44 07.98
0.0455	0.0455		0.9998		8.60587	9.64	9.99995		2 44 28.98
0.0457	0.0457		0.9998		8.60597	9.64	9.99995		2 44 49.98
0.0459	0.0459		0.9998		8.60607	9.64	9.99995		2 45 10.98
0.0461	0.0461		0.9998		8.60617	9.64	9.99995		2 45 31.98
0.0463	0.0463		0.9998		8.60627	9.64	9.99995		2 45 52.98
0.0465	0.0465		0.9998		8.60637	9.64	9.99995		2 46 13.98
0.0467	0.0467		0.9998		8.60647	9.64	9.99995		2 46 34.98
0.0469	0.0469		0.9998		8.60657	9.64	9.99995		2 46 55.98
0.0471	0.0471		0.9998		8.60667	9.64	9.99995		2 47 16.98
0.0473	0.0473		0.9998		8.60677	9.64	9.99995		2 47 37.98
0.0475	0.0475		0.9998		8.60687	9.64	9.99995		2 47 58.98
0.0477	0.0477		0.9998		8.60697	9.64	9.99995		2 48 19.98
0.0479	0.0479		0.9998		8.60707	9.64	9.99995		2 48 40.98
0.0481	0.0481		0.9998		8.60717	9.64	9.99995		2 49 01.98
0.0483	0.0483		0.9998		8.60727	9.64	9.99995		2 49 22.98
0.0485	0.0485		0.9998		8.60737	9.64	9.99995		2 49 43.98
0.0487	0.0487		0.9998		8.60747	9.64	9.99995		2 49 64.98
0.0489	0.0489		0.9998		8.60757	9.64	9.99995		2 50 25.98
0.0491	0.0491		0.9998		8.60767	9.64	9.99995		2 50 46.98
0.0493	0.0493		0.9998		8.60777	9.64	9.99995		2 51 07.98
0.0495	0.0495		0.9998		8.60787	9.64	9.99995		2 51 28.98
0.0497	0.0497		0.9998		8.60797	9.64	9.99995		2 51 49.98
0.0499	0.0499		0.9998		8.60807	9.64	9.99995		2 52 10.98
0.0500	0.0500	0.05	0.9998	0.5	8.60809	9.68	9.99996	0.2	2 51 53.44
α	$-\sin \alpha$	$\approx F_1'$	$\cos \alpha$	$\approx F_2'$	$\log \sin \alpha$	$\approx F_3'$	$\log \cos \alpha$	$\approx F_4'$	n

Circular Functions.

u	$\sin u$	$= F_1'$	$\cos u$	$= F_2'$	$\log \sin u$	$= F_3'$	$\log \cos u$	$= F_4'$	u
0.0900	0.08988	1000	0.99975	0.5	8.04879	86.8	0.00000	0.0	1 31 51.24
0.0901	0.08988		0.99975		8.04880	86.8	0.00005		2 32 13.87
0.0902	0.08988		0.99974		7.98052	86.1	0.00015		3 32 34.49
0.0903	0.08988		0.99973		7.91188	85.4	0.00025		4 32 55.12
0.0904	0.08988		0.99971		7.84225	84.7	0.00035		5 33 15.75
0.0905	0.08988	1000	0.99970	0.5	8.79111	85.0	0.00045	0.2	6 33 36.47
0.0906	0.08988		0.99972		7.91007	85.8	0.00044		7 33 57.00
0.0907	0.08988		0.99972		7.91000	85.0	0.00044		8 34 17.53
0.0908	0.08988		0.99971		7.90988	85.1	0.00044		9 34 38.05
0.0909	0.08988		0.99970		7.90971	85.2	0.00044		10 34 58.58
0.0910	0.08988	1000	0.99970	0.5	8.70724	85.4	0.00043	0.2	11 35 19.51
0.0911	0.08988		0.99970		7.90721	84.9	0.00043		12 35 40.44
0.0912	0.08988		0.99969		7.90694	84.7	0.00043		13 36 01.76
0.0913	0.08988		0.99968		7.90665	84.6	0.00043		14 36 23.18
0.0914	0.08988		0.99968		7.90637	84.4	0.00043		15 36 44.11
0.0915	0.08988	1000	0.99967	0.5	8.71461	84.1	0.00042	0.2	16 37 05.61
0.0916	0.08988		0.99967		7.91459	84.1	0.00042		17 37 26.26
0.0917	0.08988		0.99966		7.91430	84.0	0.00042		18 37 47.10
0.0918	0.08988		0.99965		7.91414	84.8	0.00042		19 38 08.52
0.0919	0.08988		0.99965		7.91397	84.7	0.00042		20 38 29.54
0.0920	0.08988	1000	0.99965	0.5	8.72191	84.3	0.00041	0.2	21 38 50.77
0.0921	0.08988		0.99964		7.92184	84.3	0.00041		22 39 11.30
0.0922	0.08988		0.99964		7.92172	84.1	0.00041		23 39 32.02
0.0923	0.08988		0.99963		7.92159	84.0	0.00041		24 39 52.95
0.0924	0.08988		0.99963		7.92145	84.8	0.00041		25 40 13.28
0.0925	0.08988	1000	0.99962	0.5	8.72926	84.0	0.00040	0.2	26 40 33.90
0.0926	0.08988		0.99962		7.92920	84.5	0.00040		27 40 54.53
0.0927	0.08988		0.99961		7.92901	84.1	0.00040		28 41 15.16
0.0928	0.08988		0.99961		7.92883	84.0	0.00040		29 41 35.98
0.0929	0.08988		0.99960		7.92865	84.0	0.00040		30 41 56.41
0.0930	0.08988	1000	0.99960	0.5	8.73697	84.0	0.00039	0.2	31 42 17.03
0.0931	0.08988		0.99959		7.93689	84.2	0.00039		32 42 37.66
0.0932	0.08988		0.99959		7.93671	84.0	0.00039		33 42 58.29
0.0933	0.08988		0.99958		7.93652	84.1	0.00039		34 43 18.91
0.0934	0.08988		0.99957		7.93633	84.1	0.00039		35 43 39.54
0.0935	0.08988	1000	0.99957	0.5	8.74415	84.1	0.00038	0.2	36 44 00.17
0.0936	0.08988		0.99956		7.94409	84.0	0.00038		37 44 20.79
0.0937	0.08988		0.99956		7.94397	84.8	0.00038		38 44 41.42
0.0938	0.08988		0.99955		7.94385	84.0	0.00038		39 45 02.05
0.0939	0.08988		0.99955		7.94368	84.5	0.00038		40 45 22.67
0.0940	0.08988	1000	0.99955	0.5	8.75148	84.3	0.00037	0.2	41 45 43.30
0.0941	0.08988		0.99954		7.95139	84.7	0.00037		42 46 03.93
0.0942	0.08988		0.99954		7.95129	84.0	0.00037		43 46 24.55
0.0943	0.08988		0.99953		7.95119	79.9	0.00037		44 46 45.18
0.0944	0.08988		0.99953		7.95108	79.8	0.00037		45 47 05.81
0.0945	0.08988	1000	0.99952	0.5	8.75918	79.6	0.00036	0.2	46 47 26.43
0.0946	0.08988		0.99951		7.95908	79.5	0.00036		47 47 47.06
0.0947	0.08988		0.99950		7.95897	79.1	0.00036		48 48 07.68
0.0948	0.08988		0.99950		7.95886	79.2	0.00036		49 48 28.31
0.0949	0.08988		0.99949		7.95875	79.0	0.00036		50 48 48.94
0.0950	0.08988	1000	0.99949	0.5	8.76614	78.9	0.00035	0.2	51 49 09.56
u	$-\sin u$	$= F_1'$	$\cos u$	$= F_2'$	$\log \sin u$	$= F_3'$	$\log \cos u$	$= F_4'$	u

SMITHSONIAN TABLES

Circular Functions.

u	$\sin u$	$\cos u$	$\tan u$	$\cot u$	$\log \sin u$	$\log \cos u$	$\log \tan u$	$\log \cot u$	$\log \sec u$
0.0550	0.05497	0.99849	0.05500	0.05497	8.74011	78.0	9.00000	0.2	3 09 04.56
0.0551	0.05499	0.99848	0.05501	0.05498	8.74012	78.0	9.00000	0.2	3 09 04.56
0.0552	0.05501	0.99847	0.05502	0.05500	8.74013	78.0	9.00000	0.2	3 09 04.56
0.0553	0.05502	0.99846	0.05503	0.05501	8.74014	78.0	9.00000	0.2	3 09 04.56
0.0554	0.05503	0.99845	0.05504	0.05502	8.74015	78.0	9.00000	0.2	3 09 04.56
0.0555	0.05504	0.99844	0.05505	0.05503	8.74016	78.0	9.00000	0.2	3 09 04.56
0.0556	0.05505	0.99843	0.05506	0.05504	8.74017	78.0	9.00000	0.2	3 09 04.56
0.0557	0.05506	0.99842	0.05507	0.05505	8.74018	78.0	9.00000	0.2	3 09 04.56
0.0558	0.05507	0.99841	0.05508	0.05506	8.74019	78.0	9.00000	0.2	3 09 04.56
0.0559	0.05508	0.99840	0.05509	0.05507	8.74020	78.0	9.00000	0.2	3 09 04.56
0.0560	0.05509	0.99839	0.05510	0.05508	8.74021	78.0	9.00000	0.2	3 09 04.56
0.0561	0.05510	0.99838	0.05511	0.05509	8.74022	78.0	9.00000	0.2	3 09 04.56
0.0562	0.05511	0.99837	0.05512	0.05510	8.74023	78.0	9.00000	0.2	3 09 04.56
0.0563	0.05512	0.99836	0.05513	0.05511	8.74024	78.0	9.00000	0.2	3 09 04.56
0.0564	0.05513	0.99835	0.05514	0.05512	8.74025	78.0	9.00000	0.2	3 09 04.56
0.0565	0.05514	0.99834	0.05515	0.05513	8.74026	78.0	9.00000	0.2	3 09 04.56
0.0566	0.05515	0.99833	0.05516	0.05514	8.74027	78.0	9.00000	0.2	3 09 04.56
0.0567	0.05516	0.99832	0.05517	0.05515	8.74028	78.0	9.00000	0.2	3 09 04.56
0.0568	0.05517	0.99831	0.05518	0.05516	8.74029	78.0	9.00000	0.2	3 09 04.56
0.0569	0.05518	0.99830	0.05519	0.05517	8.74030	78.0	9.00000	0.2	3 09 04.56
0.0570	0.05519	0.99829	0.05520	0.05518	8.74031	78.0	9.00000	0.2	3 09 04.56
0.0571	0.05520	0.99828	0.05521	0.05519	8.74032	78.0	9.00000	0.2	3 09 04.56
0.0572	0.05521	0.99827	0.05522	0.05520	8.74033	78.0	9.00000	0.2	3 09 04.56
0.0573	0.05522	0.99826	0.05523	0.05521	8.74034	78.0	9.00000	0.2	3 09 04.56
0.0574	0.05523	0.99825	0.05524	0.05522	8.74035	78.0	9.00000	0.2	3 09 04.56
0.0575	0.05524	0.99824	0.05525	0.05523	8.74036	78.0	9.00000	0.2	3 09 04.56
0.0576	0.05525	0.99823	0.05526	0.05524	8.74037	78.0	9.00000	0.2	3 09 04.56
0.0577	0.05526	0.99822	0.05527	0.05525	8.74038	78.0	9.00000	0.2	3 09 04.56
0.0578	0.05527	0.99821	0.05528	0.05526	8.74039	78.0	9.00000	0.2	3 09 04.56
0.0579	0.05528	0.99820	0.05529	0.05527	8.74040	78.0	9.00000	0.2	3 09 04.56
0.0580	0.05529	0.99819	0.05530	0.05528	8.74041	78.0	9.00000	0.2	3 09 04.56
0.0581	0.05530	0.99818	0.05531	0.05529	8.74042	78.0	9.00000	0.2	3 09 04.56
0.0582	0.05531	0.99817	0.05532	0.05530	8.74043	78.0	9.00000	0.2	3 09 04.56
0.0583	0.05532	0.99816	0.05533	0.05531	8.74044	78.0	9.00000	0.2	3 09 04.56
0.0584	0.05533	0.99815	0.05534	0.05532	8.74045	78.0	9.00000	0.2	3 09 04.56
0.0585	0.05534	0.99814	0.05535	0.05533	8.74046	78.0	9.00000	0.2	3 09 04.56
0.0586	0.05535	0.99813	0.05536	0.05534	8.74047	78.0	9.00000	0.2	3 09 04.56
0.0587	0.05536	0.99812	0.05537	0.05535	8.74048	78.0	9.00000	0.2	3 09 04.56
0.0588	0.05537	0.99811	0.05538	0.05536	8.74049	78.0	9.00000	0.2	3 09 04.56
0.0589	0.05538	0.99810	0.05539	0.05537	8.74050	78.0	9.00000	0.2	3 09 04.56
0.0590	0.05539	0.99809	0.05540	0.05538	8.74051	78.0	9.00000	0.2	3 09 04.56
0.0591	0.05540	0.99808	0.05541	0.05539	8.74052	78.0	9.00000	0.2	3 09 04.56
0.0592	0.05541	0.99807	0.05542	0.05540	8.74053	78.0	9.00000	0.2	3 09 04.56
0.0593	0.05542	0.99806	0.05543	0.05541	8.74054	78.0	9.00000	0.2	3 09 04.56
0.0594	0.05543	0.99805	0.05544	0.05542	8.74055	78.0	9.00000	0.2	3 09 04.56
0.0595	0.05544	0.99804	0.05545	0.05543	8.74056	78.0	9.00000	0.2	3 09 04.56
0.0596	0.05545	0.99803	0.05546	0.05544	8.74057	78.0	9.00000	0.2	3 09 04.56
0.0597	0.05546	0.99802	0.05547	0.05545	8.74058	78.0	9.00000	0.2	3 09 04.56
0.0598	0.05547	0.99801	0.05548	0.05546	8.74059	78.0	9.00000	0.2	3 09 04.56
0.0599	0.05548	0.99800	0.05549	0.05547	8.74060	78.0	9.00000	0.2	3 09 04.56
0.0600	0.05549	0.99799	0.05550	0.05548	8.74061	78.0	9.00000	0.2	3 09 04.56
0.0601	0.05550	0.99798	0.05551	0.05549	8.74062	78.0	9.00000	0.2	3 09 04.56
0.0602	0.05551	0.99797	0.05552	0.05550	8.74063	78.0	9.00000	0.2	3 09 04.56
0.0603	0.05552	0.99796	0.05553	0.05551	8.74064	78.0	9.00000	0.2	3 09 04.56
0.0604	0.05553	0.99795	0.05554	0.05552	8.74065	78.0	9.00000	0.2	3 09 04.56
0.0605	0.05554	0.99794	0.05555	0.05553	8.74066	78.0	9.00000	0.2	3 09 04.56
0.0606	0.05555	0.99793	0.05556	0.05554	8.74067	78.0	9.00000	0.2	3 09 04.56
0.0607	0.05556	0.99792	0.05557	0.05555	8.74068	78.0	9.00000	0.2	3 09 04.56
0.0608	0.05557	0.99791	0.05558	0.05556	8.74069	78.0	9.00000	0.2	3 09 04.56
0.0609	0.05558	0.99790	0.05559	0.05557	8.74070	78.0	9.00000	0.2	3 09 04.56
0.0610	0.05559	0.99789	0.05560	0.05558	8.74071	78.0	9.00000	0.2	3 09 04.56
0.0611	0.05560	0.99788	0.05561	0.05559	8.74072	78.0	9.00000	0.2	3 09 04.56
0.0612	0.05561	0.99787	0.05562	0.05560	8.74073	78.0	9.00000	0.2	3 09 04.56
0.0613	0.05562	0.99786	0.05563	0.05561	8.74074	78.0	9.00000	0.2	3 09 04.56
0.0614	0.05563	0.99785	0.05564	0.05562	8.74075	78.0	9.00000	0.2	3 09 04.56
0.0615	0.05564	0.99784	0.05565	0.05563	8.74076	78.0	9.00000	0.2	3 09 04.56
0.0616	0.05565	0.99783	0.05566	0.05564	8.74077	78.0	9.00000	0.2	3 09 04.56
0.0617	0.05566	0.99782	0.05567	0.05565	8.74078	78.0	9.00000	0.2	3 09 04.56
0.0618	0.05567	0.99781	0.05568	0.05566	8.74079	78.0	9.00000	0.2	3 09 04.56
0.0619	0.05568	0.99780	0.05569	0.05567	8.74080	78.0	9.00000	0.2	3 09 04.56
0.0620	0.05569	0.99779	0.05570	0.05568	8.74081	78.0	9.00000	0.2	3 09 04.56
0.0621	0.05570	0.99778	0.05571	0.05569	8.74082	78.0	9.00000	0.2	3 09 04.56
0.0622	0.05571	0.99777	0.05572	0.05570	8.74083	78.0	9.00000	0.2	3 09 04.56
0.0623	0.05572	0.99776	0.05573	0.05571	8.74084	78.0	9.00000	0.2	3 09 04.56
0.0624	0.05573	0.99775	0.05574	0.05572	8.74085	78.0	9.00000	0.2	3 09 04.56
0.0625	0.05574	0.99774	0.05575	0.05573	8.74086	78.0	9.00000	0.2	3 09 04.56
0.0626	0.05575	0.99773	0.05576	0.05574	8.74087	78.0	9.00000	0.2	3 09 04.56
0.0627	0.05576	0.99772	0.05577	0.05575	8.74088	78.0	9.00000	0.2	3 09 04.56
0.0628	0.05577	0.99771	0.05578	0.05576	8.74089	78.0	9.00000	0.2	3 09 04.56
0.0629	0.05578	0.99770	0.05579	0.05577	8.74090	78.0	9.00000	0.2	3 09 04.56
0.0630	0.05579	0.99769	0.05580	0.05578	8.74091	78.0	9.00000	0.2	3 09 04.56
0.0631	0.05580	0.99768	0.05581	0.05579	8.74092	78.0	9.00000	0.2	3 09 04.56
0.0632	0.05581	0.99767	0.05582	0.05580	8.74093	78.0	9.00000	0.2	3 09 04.56
0.0633	0.05582	0.99766	0.05583	0.05581	8.74094	78.0	9.00000	0.2	3 09 04.56
0.0634	0.05583	0.99765	0.05584	0.05582	8.74095	78.0	9.00000	0.2	3 09 04.56
0.0635	0.05584	0.99764	0.05585	0.05583	8.74096	78.0	9.00000	0.2	3 09 04.56
0.0636	0.05585	0.99763	0.05586	0.05584	8.74097	78.0	9.00000	0.2	3 09 04.56
0.0637	0.05586	0.99762	0.05587	0.05585	8.74098	78.0	9.00000	0.2	3 09 04.56
0.0638	0.05587	0.99761	0.05588	0.05586	8.74099	78.0	9.00000	0.2	3 09 04.56
0.0639	0.05588	0.99760	0.05589	0.05587	8.74100	78.0	9.00000	0.2	3 09 04.56
0.0640	0.05589	0.99759	0.05590	0.05588	8.74101	78.0	9.00000	0.2	3 09 04.56
0.0641	0.05590	0.99758	0.05591	0.05589	8.74102	78.0	9.00000	0.2	3 09 04.56
0.0642	0.05591	0.99757	0.05592	0.05590	8.74103	78.0	9.00000	0.2	3 09 04.56
0.0643	0.05592	0.99756	0.05593	0.05591	8.74104	78.0	9.00000	0.2	3 09 04.56
0.0644	0.05593	0.99755	0.05594	0.05592	8.74105	78.0	9.00000	0.2	3 09 04.56
0.0645	0.05594	0.99754	0.05595	0.05593	8.74106	78.0	9.00000	0.2	3 09 04.56
0.0646	0.05595	0.99753	0.05596	0.05594	8.74107	78.0	9.00000	0.2	3 09 04.56
0.0647	0.05596	0.99752	0.05597	0.05595	8.74108	78.0	9.00000	0.2	3 09 04.56
0.0648	0.05597	0.99751	0.05598	0.05596	8.74109	78.0	9.00000	0.2	3 09 04.56
0.0649	0.05598	0.99750	0.05599	0.05597	8.74110	78.0	9.00000	0.2	3 09 04.56
0.0650	0.05599	0.99749	0.05600	0.05598	8.74111	78.0	9.00000		

Circular Functions.

u	$\sin u$	$\sin F'$	$\cos u$	$\cos F'$	$\log \sin u$	$\sin F'$	$\log \cos u$	$\cos F'$	u
0.0000	0.00000	10.0	0.99820	0.6	8.77789	72.3	9.99922	0.3	3 26' 15.89
.0001	.00006		.99819		.77801	72.2	.99922		3 26 36.51
.0002	.00016		.99819		.77933	72.1	.99921		3 26 57.14
.0003	.00026		.99818		.78065	71.0	.99921		3 27 17.77
.0004	.00036		.99815		.78077	71.8	.99921		3 27 38.39
0.0005	0.00046	10.0	0.99817	0.6	8.78149	71.7	9.99920	0.3	3 27 59.02
.0006	.00056		.99816		.78221	71.6	.99920		3 28 19.65
.0007	.00066		.99816		.78292	71.5	.99920		3 28 40.27
.0008	.00076		.99815		.78364	71.3	.99920		3 29 00.90
.0009	.00085		.99815		.78435	71.2	.99919		3 29 21.53
0.0010	0.00095	10.0	0.99814	0.6	8.78506	71.1	9.99919	0.3	3 29 42.15
.0011	.00106		.99813		.78577	71.0	.99919		3 30 02.78
.0012	.00116		.99813		.78648	70.0	.99919		3 30 23.41
.0013	.00126		.99812		.78719	70.8	.99918		3 30 44.03
.0014	.00136		.99812		.78790	70.6	.99918		3 31 04.66
0.0015	0.00146	10.0	0.99811	0.6	8.78860	70.5	9.99918	0.3	3 31 25.29
.0016	.00156		.99810		.78931	70.4	.99918		3 31 45.91
.0017	.00166		.99810		.79002	70.3	.99917		3 32 06.54
.0018	.00176		.99809		.79071	70.2	.99917		3 32 27.17
.0019	.00186		.99808		.79141	70.1	.99917		3 32 47.79
0.0020	0.00196	10.0	0.99808	0.6	8.79211	70.0	9.99916	0.3	3 33 08.42
.0021	.00206		.99807		.79282	69.8	.99916		3 33 29.04
.0022	.00216		.99807		.79351	69.7	.99916		3 33 49.67
.0023	.00226		.99806		.79421	69.6	.99916		3 34 10.30
.0024	.00236		.99805		.79490	69.5	.99915		3 34 30.92
0.0025	0.00246	10.0	0.99805	0.6	8.79560	69.4	9.99915	0.3	3 34 51.55
.0026	.00256		.99804		.79630	69.3	.99915		3 35 12.18
.0027	.00266		.99804		.79698	69.2	.99915		3 35 32.80
.0028	.00276		.99803		.79767	69.1	.99914		3 35 53.43
.0029	.00286		.99802		.79836	69.0	.99914		3 36 14.06
0.0030	0.00296	10.0	0.99802	0.6	8.79905	68.8	9.99914	0.3	3 36 34.68
.0031	.00306		.99801		.79974	68.7	.99913		3 36 55.31
.0032	.00316		.99800		.80043	68.6	.99913		3 37 15.94
.0033	.00326		.99800		.80111	68.5	.99913		3 37 36.56
.0034	.00336		.99799		.80180	68.4	.99913		3 37 57.19
0.0035	0.00346	10.0	0.99798	0.6	8.80248	68.3	9.99912	0.3	3 38 17.82
.0036	.00356		.99798		.80316	68.2	.99912		3 38 38.44
.0037	.00366		.99797		.80385	68.1	.99912		3 38 59.07
.0038	.00376		.99797		.80453	68.0	.99912		3 39 19.69
.0039	.00386		.99796		.80521	67.9	.99911		3 39 40.32
0.0040	0.00396	10.0	0.99795	0.6	8.80588	67.8	9.99911	0.3	3 40 00.95
.0041	.00406		.99795		.80656	67.7	.99911		3 40 21.57
.0042	.00416		.99794		.80724	67.6	.99910		3 40 42.20
.0043	.00426		.99793		.80791	67.4	.99910		3 41 02.83
.0044	.00436		.99793		.80859	67.3	.99910		3 41 23.45
0.0045	0.00446	10.0	0.99792	0.6	8.80925	67.2	9.99910	0.3	3 41 44.08
.0046	.00456		.99791		.80993	67.1	.99909		3 42 04.71
.0047	.00465		.99791		.81060	67.0	.99909		3 42 25.33
.0048	.00475		.99790		.81127	66.9	.99909		3 42 45.96
.0049	.00485		.99789		.81194	66.8	.99908		3 43 06.59
0.0050	0.00495	10.0	0.99789	0.6	8.81261	66.7	9.99908	0.3	3 43 27.21
u	$-\sin u$	$\sin F'$	$\cos u$	$\cos F'$	$\log \frac{\sin u}{u}$	$\sin F'$	$\log \cos u$	$\cos F'$	u

Circular Functions.

x	$\sin x$	$\pi F_1'$	$\cos x$	$\pi F_2'$	$\log \sin x$	$\pi F_3'$	$\log \cos x$	$\pi F_4'$	x
0.0000	0.00000	0.00	0.99999	0.00	8.841261	06.7	0.00000	0.00	3 43 27.27
0.0001	0.00010	0.00	0.99990	0.00	8.84127	06.6	0.00000	0.00	3 43 47.81
0.0002	0.00020	0.00	0.99980	0.00	8.84131	06.5	0.00000	0.00	3 44 08.47
0.0003	0.00030	0.00	0.99970	0.00	8.84136	06.4	0.00000	0.00	3 44 29.09
0.0004	0.00040	0.00	0.99960	0.00	8.84142	06.3	0.00000	0.00	3 44 49.72
0.0005	0.00050	0.00	0.99950	0.00	8.84148	06.2	0.00000	0.00	3 45 10.34
0.0006	0.00060	0.00	0.99940	0.00	8.84155	06.1	0.00000	0.00	3 45 30.97
0.0007	0.00070	0.00	0.99930	0.00	8.84162	06.0	0.00000	0.00	3 45 51.60
0.0008	0.00080	0.00	0.99920	0.00	8.84170	05.9	0.00000	0.00	3 46 12.22
0.0009	0.00090	0.00	0.99910	0.00	8.84177	05.8	0.00000	0.00	3 46 32.85
0.0010	0.00100	0.00	0.99900	0.00	8.84185	05.7	0.00000	0.00	3 46 53.48
0.0011	0.00110	0.00	0.99890	0.00	8.84194	05.6	0.00000	0.00	3 47 14.10
0.0012	0.00120	0.00	0.99880	0.00	8.84203	05.5	0.00000	0.00	3 47 34.73
0.0013	0.00130	0.00	0.99870	0.00	8.84213	05.4	0.00000	0.00	3 47 55.36
0.0014	0.00140	0.00	0.99860	0.00	8.84223	05.3	0.00000	0.00	3 48 15.98
0.0015	0.00150	0.00	0.99850	0.00	8.84233	05.2	0.00000	0.00	3 48 36.61
0.0016	0.00160	0.00	0.99840	0.00	8.84243	05.1	0.00000	0.00	3 48 57.24
0.0017	0.00170	0.00	0.99830	0.00	8.84253	05.0	0.00000	0.00	3 49 17.86
0.0018	0.00180	0.00	0.99820	0.00	8.84263	04.9	0.00000	0.00	3 49 38.49
0.0019	0.00190	0.00	0.99810	0.00	8.84273	04.8	0.00000	0.00	3 49 59.12
0.0020	0.00200	0.00	0.99800	0.00	8.84283	04.7	0.00000	0.00	3 50 19.74
0.0021	0.00210	0.00	0.99790	0.00	8.84293	04.6	0.00000	0.00	3 50 40.37
0.0022	0.00220	0.00	0.99780	0.00	8.84303	04.5	0.00000	0.00	3 51 00.99
0.0023	0.00230	0.00	0.99770	0.00	8.84313	04.4	0.00000	0.00	3 51 21.62
0.0024	0.00240	0.00	0.99760	0.00	8.84323	04.3	0.00000	0.00	3 51 42.25
0.0025	0.00250	0.00	0.99750	0.00	8.84333	04.2	0.00000	0.00	3 52 02.87
0.0026	0.00260	0.00	0.99740	0.00	8.84343	04.1	0.00000	0.00	3 52 23.50
0.0027	0.00270	0.00	0.99730	0.00	8.84353	04.0	0.00000	0.00	3 52 44.13
0.0028	0.00280	0.00	0.99720	0.00	8.84363	03.9	0.00000	0.00	3 53 04.75
0.0029	0.00290	0.00	0.99710	0.00	8.84373	03.8	0.00000	0.00	3 53 25.38
0.0030	0.00300	0.00	0.99700	0.00	8.84383	03.7	0.00000	0.00	3 53 46.01
0.0031	0.00310	0.00	0.99690	0.00	8.84393	03.6	0.00000	0.00	3 54 06.63
0.0032	0.00320	0.00	0.99680	0.00	8.84403	03.5	0.00000	0.00	3 54 27.26
0.0033	0.00330	0.00	0.99670	0.00	8.84413	03.4	0.00000	0.00	3 54 47.89
0.0034	0.00340	0.00	0.99660	0.00	8.84423	03.3	0.00000	0.00	3 55 08.51
0.0035	0.00350	0.00	0.99650	0.00	8.84433	03.2	0.00000	0.00	3 55 29.14
0.0036	0.00360	0.00	0.99640	0.00	8.84443	03.1	0.00000	0.00	3 55 49.77
0.0037	0.00370	0.00	0.99630	0.00	8.84453	03.0	0.00000	0.00	3 56 10.39
0.0038	0.00380	0.00	0.99620	0.00	8.84463	02.9	0.00000	0.00	3 56 31.02
0.0039	0.00390	0.00	0.99610	0.00	8.84473	02.8	0.00000	0.00	3 56 51.65
0.0040	0.00400	0.00	0.99600	0.00	8.84483	02.7	0.00000	0.00	3 57 12.27
0.0041	0.00410	0.00	0.99590	0.00	8.84493	02.6	0.00000	0.00	3 57 32.90
0.0042	0.00420	0.00	0.99580	0.00	8.84503	02.5	0.00000	0.00	3 57 53.53
0.0043	0.00430	0.00	0.99570	0.00	8.84513	02.4	0.00000	0.00	3 58 14.15
0.0044	0.00440	0.00	0.99560	0.00	8.84523	02.3	0.00000	0.00	3 58 34.78
0.0045	0.00450	0.00	0.99550	0.00	8.84533	02.2	0.00000	0.00	3 58 55.40
0.0046	0.00460	0.00	0.99540	0.00	8.84543	02.1	0.00000	0.00	3 59 16.03
0.0047	0.00470	0.00	0.99530	0.00	8.84553	02.0	0.00000	0.00	3 59 36.66
0.0048	0.00480	0.00	0.99520	0.00	8.84563	01.9	0.00000	0.00	3 59 57.28
0.0049	0.00490	0.00	0.99510	0.00	8.84573	01.8	0.00000	0.00	4 00 17.91
0.0050	0.00500	0.00	0.99500	0.00	8.84583	01.7	0.00000	0.00	4 00 38.54
x	$-\log \sin x$	$\pi F_1'$	$\cos x$	$\pi F_2'$	$\log \sin x$	$\pi F_3'$	$\log \cos x$	$\pi F_4'$	x

Circular Functions.

u	$\sin u$	$= F'$	$\cos u$	$= F'$	$\log \sin u$	$= F'$	$\log \cos u$	$= F'$	u
0.0700	0.05994	10.0	0.99755	0.7	8.84474	61.9	9.99804	0.3	4 00 38.54
0.0701	0.06004		0.99751		8.84505	61.9	9.99803		4 00 39.10
0.0702	0.06014		0.99747		8.84538	61.8	9.99801		4 01 39.79
0.0703	0.06024		0.99743		8.84569	61.7	9.99800		4 01 40.42
0.0704	0.06034		0.99739		8.84601	61.6	9.99799		4 02 01.04
0.0705	0.06044	10.0	0.99735	0.7	8.84633	61.5	9.99798	0.3	4 02 21.67
0.0706	0.06054		0.99731		8.84664	61.4	9.99797		4 02 42.30
0.0707	0.06064		0.99727		8.84696	61.3	9.99796		4 03 02.92
0.0708	0.06074		0.99723		8.84727	61.2	9.99795		4 03 23.55
0.0709	0.06084		0.99719		8.84759	61.2	9.99794		4 03 44.17
0.0710	0.06094	10.0	0.99715	0.7	8.84790	61.1	9.99793	0.3	4 04 04.80
0.0711	0.06104		0.99711		8.84821	61.0	9.99792		4 04 25.43
0.0712	0.06114		0.99707		8.84852	60.9	9.99791		4 04 46.05
0.0713	0.06124		0.99703		8.84883	60.8	9.99790		4 05 06.68
0.0714	0.06134		0.99699		8.84914	60.7	9.99789		4 05 27.31
0.0715	0.06144	10.0	0.99695	0.7	8.84945	60.6	9.99788	0.3	4 05 47.93
0.0716	0.06154		0.99691		8.84976	60.6	9.99787		4 06 08.56
0.0717	0.06164		0.99687		8.85007	60.5	9.99786		4 06 29.19
0.0718	0.06174		0.99683		8.85038	60.4	9.99785		4 06 49.81
0.0719	0.06184		0.99679		8.85069	60.3	9.99784		4 07 10.44
0.0720	0.06194	10.0	0.99675	0.7	8.85100	60.2	9.99783	0.3	4 07 31.07
0.0721	0.06204		0.99671		8.85131	60.1	9.99782		4 07 51.69
0.0722	0.06214		0.99667		8.85162	60.0	9.99781		4 08 12.32
0.0723	0.06224		0.99663		8.85193	60.0	9.99780		4 08 32.95
0.0724	0.06234		0.99659		8.85224	59.9	9.99779		4 08 53.57
0.0725	0.06244	10.0	0.99655	0.7	8.85255	59.8	9.99778	0.3	4 09 14.20
0.0726	0.06254		0.99651		8.85286	59.7	9.99777		4 09 34.82
0.0727	0.06264		0.99647		8.85317	59.6	9.99776		4 09 55.45
0.0728	0.06274		0.99643		8.85348	59.5	9.99775		4 10 16.08
0.0729	0.06284		0.99639		8.85379	59.5	9.99774		4 10 36.70
0.0730	0.06294	10.0	0.99635	0.7	8.85410	59.4	9.99773	0.3	4 10 57.33
0.0731	0.06304		0.99631		8.85441	59.3	9.99772		4 11 17.96
0.0732	0.06314		0.99627		8.85472	59.2	9.99771		4 11 38.58
0.0733	0.06324		0.99623		8.85503	59.1	9.99770		4 11 59.21
0.0734	0.06334		0.99619		8.85534	59.1	9.99769		4 12 19.84
0.0735	0.06344	10.0	0.99615	0.7	8.85565	59.0	9.99768	0.3	4 12 40.46
0.0736	0.06354		0.99611		8.85596	58.9	9.99767		4 13 01.09
0.0737	0.06364		0.99607		8.85627	58.8	9.99766		4 13 21.72
0.0738	0.06374		0.99603		8.85658	58.7	9.99765		4 13 42.34
0.0739	0.06384		0.99599		8.85689	58.7	9.99764		4 14 02.97
0.0740	0.06394	10.0	0.99595	0.7	8.85720	58.6	9.99763	0.3	4 14 23.60
0.0741	0.06404		0.99591		8.85751	58.5	9.99762		4 14 44.22
0.0742	0.06414		0.99587		8.85782	58.4	9.99761		4 15 04.85
0.0743	0.06424		0.99583		8.85813	58.3	9.99760		4 15 25.48
0.0744	0.06434		0.99579		8.85844	58.3	9.99759		4 15 46.10
0.0745	0.06444	10.0	0.99575	0.7	8.85875	58.2	9.99758	0.3	4 16 06.73
0.0746	0.06454		0.99571		8.85906	58.1	9.99757		4 16 27.35
0.0747	0.06464		0.99567		8.85937	58.0	9.99756		4 16 47.98
0.0748	0.06474		0.99563		8.85968	58.0	9.99755		4 17 08.61
0.0749	0.06484		0.99559		8.85999	57.9	9.99754		4 17 29.23
0.0750	0.06494	10.0	0.99555	0.7	8.86030	57.8	9.99753	0.3	4 17 49.86
u	$-\sin u$	$= F'$	$\csc u$	$= F'$	$\log \frac{\csc u}{1}$	$= F'$	$\log \csc u$	$= F'$	u

Circular Functions.

α	$\sin \alpha$	$= F_1'$	$\cos \alpha$	$= F_1'$	$\log \sin \alpha$	$= F_2'$	$\log \cos \alpha$	$= F_2'$	α
0.0750	0.07493	10.00	0.99270	0.7	8.87495	57.8	0.00078	0.3	4 17 49.86
0.0751	0.07494		0.99268	0.8	8.87501	57.7	0.00077		4 18 10.49
0.0752	0.07514		0.99267		8.87506	57.6	0.00077		4 18 31.11
0.0753	0.07515		0.99267		8.87511	57.5	0.00077		4 18 51.74
0.0754	0.07515		0.99266		8.87516	57.5	0.00076		4 19 12.37
0.0755	0.07515	10.00	0.99265	0.8	8.87521	57.4	0.00076	0.3	4 19 32.99
0.0756	0.07515		0.99264		8.87526	57.3	0.00076		4 19 53.62
0.0757	0.07515		0.99264		8.87531	57.3	0.00075		4 20 14.25
0.0758	0.07515		0.99264		8.87536	57.2	0.00075		4 20 34.87
0.0759	0.07515		0.99263		8.87541	57.1	0.00075		4 20 55.50
0.0760	0.07515	10.00	0.99263	0.8	8.87546	57.0	0.00074	0.3	4 21 16.13
0.0761	0.07515		0.99262		8.87551	57.0	0.00074		4 21 36.75
0.0762	0.07515		0.99262		8.87556	56.9	0.00074		4 21 57.38
0.0763	0.07515		0.99261		8.87561	56.9	0.00073		4 22 18.00
0.0764	0.07515		0.99261		8.87566	56.7	0.00073		4 22 38.63
0.0765	0.07515	10.00	0.99261	0.8	8.87571	56.7	0.00073	0.3	4 22 59.26
0.0766	0.07515		0.99260		8.87576	56.6	0.00072		4 23 19.88
0.0767	0.07515		0.99260		8.87581	56.5	0.00072		4 23 40.51
0.0768	0.07515		0.99259		8.87586	56.4	0.00072		4 24 01.14
0.0769	0.07515		0.99259		8.87591	56.4	0.00071		4 24 21.76
0.0770	0.07515	10.00	0.99259	0.8	8.87596	56.3	0.00071	0.3	4 24 42.39
0.0771	0.07515		0.99258		8.87601	56.2	0.00071		4 25 03.02
0.0772	0.07515		0.99258		8.87606	56.1	0.00070		4 25 23.64
0.0773	0.07515		0.99258		8.87611	56.0	0.00070		4 25 44.27
0.0774	0.07515		0.99257		8.87616	56.0	0.00070		4 26 04.90
0.0775	0.07515	10.00	0.99257	0.8	8.87621	55.9	0.00069	0.3	4 26 25.52
0.0776	0.07515		0.99257		8.87626	55.8	0.00069		4 26 46.15
0.0777	0.07515		0.99256		8.87631	55.8	0.00069		4 27 06.78
0.0778	0.07515		0.99256		8.87636	55.7	0.00068		4 27 27.40
0.0779	0.07515		0.99256		8.87641	55.6	0.00068		4 27 48.03
0.0780	0.07515	10.00	0.99256	0.8	8.87646	55.6	0.00068	0.3	4 28 08.66
0.0781	0.07515		0.99255		8.87651	55.5	0.00067		4 28 29.28
0.0782	0.07515		0.99255		8.87656	55.4	0.00067		4 28 49.91
0.0783	0.07515		0.99255		8.87661	55.4	0.00067		4 29 10.53
0.0784	0.07515		0.99254		8.87666	55.3	0.00066		4 29 31.16
0.0785	0.07515	10.00	0.99254	0.8	8.87671	55.2	0.00066	0.3	4 29 51.79
0.0786	0.07515		0.99254		8.87676	55.1	0.00066		4 30 12.41
0.0787	0.07515		0.99253		8.87681	55.1	0.00065		4 30 33.04
0.0788	0.07515		0.99253		8.87686	55.0	0.00065		4 30 53.67
0.0789	0.07515		0.99253		8.87691	54.9	0.00065		4 31 14.29
0.0790	0.07515	10.00	0.99253	0.8	8.87696	54.9	0.00064	0.3	4 31 34.92
0.0791	0.07515		0.99252		8.87701	54.8	0.00064		4 31 55.55
0.0792	0.07515		0.99252		8.87706	54.7	0.00064		4 32 16.17
0.0793	0.07515		0.99252		8.87711	54.7	0.00063		4 32 36.80
0.0794	0.07515		0.99251		8.87716	54.6	0.00063		4 32 57.43
0.0795	0.07515	10.00	0.99251	0.8	8.87721	54.6	0.00063	0.3	4 33 18.05
0.0796	0.07515		0.99251		8.87726	54.5	0.00062		4 33 38.68
0.0797	0.07515		0.99250		8.87731	54.5	0.00062		4 33 59.31
0.0798	0.07515		0.99250		8.87736	54.4	0.00062		4 34 19.93
0.0799	0.07515		0.99250		8.87741	54.4	0.00061		4 34 40.56
0.0800	0.07515	10.00	0.99250	0.8	8.87746	54.2	0.00061	0.3	4 35 01.18
α	$-\sin \alpha$	$= F_1'$	$\sec \alpha$	$= F_1'$	$\log \sin \alpha$	$= F_2'$	$\log \sec \alpha$	$= F_2'$	α

Circular Functions.

u	$\sin u$	$u \text{ } ^\circ$	$\cos u$	$u \text{ } ^\circ$	$\log \sin u$	$u \text{ } ^\circ$	$\log \cos u$	$u \text{ } ^\circ$	u
0.0800	0.079901	10.0	0.996880	0.8	8.902653	54.2	9.998901	0.3	4 35 01.18
0.0801	0.080001		0.996970		0.90317	54.1	9.998901		4 35 21.81
0.0802	0.080101		0.997070		0.90371	54.0	9.998900		4 35 42.44
0.0803	0.080201		0.99718		0.90425	54.0	9.998900		4 36 03.06
0.0804	0.080301		0.99727		0.90479	53.9	9.998899		4 36 23.69
0.0805	0.080401	10.0	0.99736	0.8	8.90533	53.8	9.998899	0.4	4 36 44.32
0.0806	0.080501		0.99745		0.90586	53.8	9.998899		4 37 04.94
0.0807	0.080601		0.99755		0.90640	53.7	9.998898		4 37 25.57
0.0808	0.080701		0.99764		0.90694	53.6	9.998898		4 37 46.20
0.0809	0.080801		0.99773		0.90747	53.6	9.998898		4 38 06.82
0.0810	0.080901	10.0	0.99782	0.8	8.90801	53.5	9.998897	0.4	4 38 27.45
0.0811	0.081001		0.99791		0.90854	53.4	9.998897		4 38 48.08
0.0812	0.081101		0.99799		0.90908	53.4	9.998897		4 39 08.70
0.0813	0.081201		0.99808		0.90961	53.3	9.998896		4 39 29.33
0.0814	0.081301		0.99816		0.91014	53.2	9.998896		4 39 49.96
0.0815	0.081401	10.0	0.99825	0.8	8.91068	53.2	9.998896	0.4	4 40 10.58
0.0816	0.081501		0.99833		0.91121	53.1	9.998895		4 40 31.21
0.0817	0.081601		0.99842		0.91174	53.0	9.998895		4 40 51.83
0.0818	0.081701		0.99850		0.91227	53.0	9.998895		4 41 12.46
0.0819	0.081801		0.99858		0.91280	52.9	9.998894		4 41 33.09
0.0820	0.081901	10.0	0.99866	0.8	8.91333	52.8	9.998894	0.4	4 41 53.71
0.0821	0.082001		0.99875		0.91386	52.8	9.998894		4 42 14.34
0.0822	0.082101		0.99883		0.91438	52.7	9.998893		4 42 34.97
0.0823	0.082201		0.99891		0.91491	52.7	9.998893		4 42 55.59
0.0824	0.082301		0.99899		0.91544	52.6	9.998892		4 43 16.22
0.0825	0.082401	10.0	0.99906	0.8	8.91596	52.5	9.998892	0.4	4 43 36.85
0.0826	0.082501		0.99915		0.91649	52.5	9.998892		4 43 57.47
0.0827	0.082601		0.99923		0.91701	52.4	9.998891		4 44 18.10
0.0828	0.082701		0.99931		0.91753	52.3	9.998891		4 44 38.73
0.0829	0.082801		0.99939		0.91806	52.3	9.998891		4 44 59.35
0.0830	0.082901	10.0	0.99946	0.8	8.91858	52.2	9.998890	0.4	4 45 19.98
0.0831	0.083001		0.99955		0.91910	52.1	9.998890		4 45 40.61
0.0832	0.083101		0.99963		0.91962	52.1	9.998890		4 46 01.23
0.0833	0.083201		0.99971		0.92014	52.0	9.998889		4 46 21.86
0.0834	0.083301		0.99979		0.92066	52.0	9.998889		4 46 42.48
0.0835	0.083401	10.0	0.99986	0.8	8.92118	51.9	9.998888	0.4	4 47 03.11
0.0836	0.083501		0.99994		0.92170	51.8	9.998888		4 47 23.74
0.0837	0.083601		0.99999		0.92222	51.8	9.998888		4 47 44.36
0.0838	0.083701		0.99999		0.92274	51.7	9.998887		4 48 04.99
0.0839	0.083801		0.99999		0.92325	51.6	9.998887		4 48 25.62
0.0840	0.083901	10.0	0.99999	0.8	8.92377	51.5	9.998887	0.4	4 48 46.24
0.0841	0.084001		0.99999		0.92428	51.5	9.998886		4 49 06.87
0.0842	0.084101		0.99999		0.92480	51.5	9.998886		4 49 27.50
0.0843	0.084201		0.99999		0.92531	51.4	9.998885		4 49 48.12
0.0844	0.084301		0.99999		0.92583	51.3	9.998885		4 50 08.75
0.0845	0.084401	10.0	0.99999	0.8	8.92634	51.3	9.998885	0.4	4 50 29.38
0.0846	0.084501		0.99999		0.92685	51.2	9.998884		4 50 50.00
0.0847	0.084601		0.99999		0.92736	51.2	9.998884		4 51 10.63
0.0848	0.084701		0.99999		0.92788	51.1	9.998884		4 51 31.26
0.0849	0.084801		0.99999		0.92839	51.0	9.998883		4 51 51.88
0.0850	0.084901	10.0	0.99999	0.8	8.92890	51.0	9.998883	0.4	4 52 12.51
u	$-1 \sinh u$	$u \text{ } ^\circ$	$\cosh u$	$u \text{ } ^\circ$	$\log \sinh u$	$u \text{ } ^\circ$	$\log \cosh u$	$u \text{ } ^\circ$	u

Circular Functions.

x	$\sin x$	$= F'$	$\cos x$	$= F'$	$\log \sin x$	$= F'$	$\log \cos x$	$= F'$	g
0.0000	0.00000	10.00	1.00000	0.00	8.00000	51.0	9.00000	0.4	4 52 12.51
0.0001	0.00000		0.99999	0.00	0.0001	50.9	0.00000		4 52 33.14
0.0002	0.00000		0.99997	0.00	0.0002	50.9	0.00000		4 52 53.76
0.0003	0.00000		0.99995	0.00	0.0003	50.8	0.00000		4 53 14.39
0.0004	0.00000		0.99993	0.00	0.0004	50.7	0.00000		4 53 35.01
0.0005	0.00000	10.00	0.99991	0.00	8.00144	50.7	9.00000	0.4	4 53 55.64
0.0006	0.00000		0.99989	0.00	0.00144	50.6	0.00000		4 54 16.27
0.0007	0.00000		0.99987	0.00	0.00145	50.6	0.00000		4 54 36.89
0.0008	0.00000		0.99985	0.00	0.00145	50.5	0.00000		4 54 57.52
0.0009	0.00000		0.99983	0.00	0.00145	50.4	0.00000		4 55 18.15
0.0010	0.00000	10.00	0.99981	0.00	8.00286	50.4	9.00000	0.4	4 55 38.77
0.0011	0.00000		0.99979	0.00	0.00287	50.3	0.00000		4 55 59.40
0.0012	0.00000		0.99977	0.00	0.00287	50.3	0.00000		4 56 20.03
0.0013	0.00000		0.99975	0.00	0.00287	50.2	0.00000		4 56 40.65
0.0014	0.00000		0.99973	0.00	0.00287	50.1	0.00000		4 57 01.28
0.0015	0.00000	10.00	0.99971	0.00	8.00427	50.1	9.00000	0.4	4 57 21.91
0.0016	0.00000		0.99969	0.00	0.00427	50.0	0.00000		4 57 42.53
0.0017	0.00000		0.99967	0.00	0.00427	50.0	0.00000		4 58 03.16
0.0018	0.00000		0.99965	0.00	0.00427	49.9	0.00000		4 58 23.79
0.0019	0.00000		0.99963	0.00	0.00427	49.9	0.00000		4 58 44.41
0.0020	0.00000	10.00	0.99961	0.00	8.00567	49.8	9.00000	0.4	4 59 05.04
0.0021	0.00000		0.99959	0.00	0.00567	49.7	0.00000		4 59 25.66
0.0022	0.00000		0.99957	0.00	0.00567	49.7	0.00000		4 59 46.29
0.0023	0.00000		0.99955	0.00	0.00567	49.6	0.00000		5 00 06.92
0.0024	0.00000		0.99953	0.00	0.00567	49.6	0.00000		5 00 27.54
0.0025	0.00000	10.00	0.99951	0.00	8.00707	49.5	9.00000	0.4	5 00 48.17
0.0026	0.00000		0.99949	0.00	0.00707	49.5	0.00000		5 01 08.80
0.0027	0.00000		0.99947	0.00	0.00707	49.4	0.00000		5 01 29.42
0.0028	0.00000		0.99945	0.00	0.00707	49.3	0.00000		5 01 50.05
0.0029	0.00000		0.99943	0.00	0.00707	49.3	0.00000		5 02 10.68
0.0030	0.00000	10.00	0.99941	0.00	8.00847	49.2	9.00000	0.4	5 02 31.30
0.0031	0.00000		0.99939	0.00	0.00847	49.2	0.00000		5 02 51.93
0.0032	0.00000		0.99937	0.00	0.00847	49.1	0.00000		5 03 12.56
0.0033	0.00000		0.99935	0.00	0.00847	49.1	0.00000		5 03 33.18
0.0034	0.00000		0.99933	0.00	0.00847	49.0	0.00000		5 03 53.81
0.0035	0.00000	10.00	0.99931	0.00	8.00987	48.9	9.00000	0.4	5 04 14.44
0.0036	0.00000		0.99929	0.00	0.00987	48.9	0.00000		5 04 35.06
0.0037	0.00000		0.99927	0.00	0.00987	48.8	0.00000		5 04 55.69
0.0038	0.00000		0.99925	0.00	0.00987	48.8	0.00000		5 05 16.31
0.0039	0.00000		0.99923	0.00	0.00987	48.7	0.00000		5 05 36.94
0.0040	0.00000	10.00	0.99921	0.00	8.01127	48.7	9.00000	0.4	5 05 57.57
0.0041	0.00000		0.99919	0.00	0.01127	48.6	0.00000		5 06 18.19
0.0042	0.00000		0.99917	0.00	0.01127	48.6	0.00000		5 06 38.82
0.0043	0.00000		0.99915	0.00	0.01127	48.5	0.00000		5 06 59.45
0.0044	0.00000		0.99913	0.00	0.01127	48.5	0.00000		5 07 20.07
0.0045	0.00000	10.00	0.99911	0.00	8.01267	48.4	9.00000	0.4	5 07 40.70
0.0046	0.00000		0.99909	0.00	0.01267	48.4	0.00000		5 08 01.33
0.0047	0.00000		0.99907	0.00	0.01267	48.3	0.00000		5 08 21.95
0.0048	0.00000		0.99905	0.00	0.01267	48.2	0.00000		5 08 42.58
0.0049	0.00000		0.99903	0.00	0.01267	48.2	0.00000		5 09 03.21
0.0050	0.00000	10.00	0.99901	0.00	8.01407	48.1	9.00000	0.4	5 09 23.83
x	$\sin x$	$= F'$	$\cos x$	$= F'$	$\log \sin x$	$= F'$	$\log \cos x$	$= F'$	g

BRITISH TABLES

Circular Functions.

α	$\sin \alpha$	α in $^\circ$	$\cos \alpha$	α in $^\circ$	$\log \sin \alpha$	α in $^\circ$	$\log \cos \alpha$	α in $^\circ$	α
0.0000	0.00000	0.0	0.99999	0.0	8.05366	48.1	9.99884	0.4	5 00 43.81
.0001	.00008	.0001	.99994	.0001	.05414	48.1	.99883	.0001	5 00 44.46
.0002	.00016	.0002	.99988	.0002	.05462	48.0	.99882	.0002	5 10 05.00
.0003	.00024	.0003	.99981	.0003	.05510	48.0	.99881	.0003	5 10 25.71
.0004	.00032	.0004	.99974	.0004	.05558	47.9	.99880	.0004	5 10 46.34
0.0005	0.00040	0.0005	0.99966	0.0005	8.05626	47.9	9.99878	0.4	5 11 06.05
.0006	.00048	.0006	.99959	.0006	.05673	47.8	.99877	.0006	5 11 27.30
.0007	.00056	.0007	.99951	.0007	.05721	47.8	.99876	.0007	5 11 48.22
.0008	.00064	.0008	.99943	.0008	.05769	47.7	.99875	.0008	5 12 08.81
.0009	.00072	.0009	.99935	.0009	.05817	47.6	.99874	.0009	5 12 29.47
0.0010	0.00080	0.0010	0.99927	0.0010	8.05844	47.6	9.99872	0.4	5 12 50.10
.0011	.00088	.0011	.99919	.0011	.05892	47.5	.99871	.0011	5 13 10.72
.0012	.00096	.0012	.99911	.0012	.05940	47.5	.99870	.0012	5 13 31.35
.0013	.00104	.0013	.99903	.0013	.05988	47.4	.99869	.0013	5 13 51.98
.0014	.00112	.0014	.99895	.0014	.06036	47.4	.99868	.0014	5 14 12.60
0.0015	0.00120	0.0015	0.99887	0.0015	8.06081	47.3	9.99866	0.4	5 14 33.23
.0016	.00128	.0016	.99879	.0016	.06129	47.3	.99865	.0016	5 14 53.86
.0017	.00136	.0017	.99871	.0017	.06177	47.2	.99864	.0017	5 15 14.48
.0018	.00144	.0018	.99863	.0018	.06225	47.2	.99863	.0018	5 15 35.11
.0019	.00152	.0019	.99855	.0019	.06273	47.1	.99862	.0019	5 15 55.74
0.0020	0.00160	0.0020	0.99847	0.0020	8.06317	47.1	9.99860	0.4	5 16 16.36
.0021	.00168	.0021	.99839	.0021	.06365	47.0	.99859	.0021	5 16 36.99
.0022	.00176	.0022	.99831	.0022	.06413	47.0	.99858	.0022	5 16 57.62
.0023	.00184	.0023	.99823	.0023	.06461	46.9	.99857	.0023	5 17 18.24
.0024	.00192	.0024	.99815	.0024	.06509	46.9	.99856	.0024	5 17 38.87
0.0025	0.00200	0.0025	0.99807	0.0025	8.06552	46.8	9.99854	0.4	5 17 59.49
.0026	.00208	.0026	.99799	.0026	.06600	46.8	.99853	.0026	5 18 20.12
.0027	.00216	.0027	.99791	.0027	.06648	46.7	.99852	.0027	5 18 40.75
.0028	.00224	.0028	.99783	.0028	.06696	46.7	.99851	.0028	5 19 01.37
.0029	.00232	.0029	.99775	.0029	.06744	46.6	.99850	.0029	5 19 22.00
0.0030	0.00240	0.0030	0.99767	0.0030	8.06786	46.6	9.99848	0.4	5 19 42.63
.0031	.00248	.0031	.99759	.0031	.06792	46.5	.99847	.0031	5 20 03.25
.0032	.00256	.0032	.99751	.0032	.06840	46.5	.99846	.0032	5 20 23.88
.0033	.00264	.0033	.99743	.0033	.06888	46.4	.99845	.0033	5 20 44.51
.0034	.00272	.0034	.99735	.0034	.06936	46.4	.99844	.0034	5 21 05.13
0.0035	0.00280	0.0035	0.99727	0.0035	8.06918	46.3	9.99842	0.4	5 21 25.76
.0036	.00288	.0036	.99719	.0036	.07004	46.3	.99841	.0036	5 21 46.39
.0037	.00296	.0037	.99711	.0037	.07052	46.2	.99840	.0037	5 22 07.01
.0038	.00304	.0038	.99703	.0038	.07100	46.2	.99839	.0038	5 22 27.64
.0039	.00312	.0039	.99695	.0039	.07148	46.1	.99838	.0039	5 22 48.27
0.0040	0.00320	0.0040	0.99687	0.0040	8.07140	46.1	9.99836	0.4	5 23 08.89
.0041	.00328	.0041	.99679	.0041	.07188	46.0	.99835	.0041	5 23 29.52
.0042	.00336	.0042	.99671	.0042	.07236	46.0	.99834	.0042	5 23 50.14
.0043	.00344	.0043	.99663	.0043	.07284	45.9	.99833	.0043	5 24 10.77
.0044	.00352	.0044	.99655	.0044	.07332	45.9	.99832	.0044	5 24 31.40
0.0045	0.00360	0.0045	0.99647	0.0045	8.07470	45.8	9.99830	0.4	5 24 52.02
.0046	.00368	.0046	.99639	.0046	.07374	45.8	.99829	.0046	5 25 12.65
.0047	.00376	.0047	.99631	.0047	.07422	45.7	.99828	.0047	5 25 33.28
.0048	.00384	.0048	.99623	.0048	.07470	45.7	.99827	.0048	5 25 53.90
.0049	.00392	.0049	.99615	.0049	.07518	45.6	.99826	.0049	5 26 14.53
0.0050	0.00400	0.0050	0.99607	0.0050	8.07707	45.6	9.99824	0.4	5 26 35.16
u	$-\sin u$	u in $^\circ$	$\cos u$	u in $^\circ$	$\log \sin u$	u in $^\circ$	$\log \cos u$	u in $^\circ$	u

Circular Functions.

u	$\sin u$	$\cos u$	$\tan u$	$\sec u$	$\csc u$	$\cot u$	$\log \sin u$	$\log \cos u$	$\log \tan u$	$\log \sec u$	$\log \csc u$	$\log \cot u$
0.0000	0.000000	1.000000	0.000000	1.000000	1.000000	∞	8.000000	4.500000	0.000000	0.000000	0.000000	0.000000
0.0001	0.000099	0.999999	0.000100	1.000100	1.000100	9999.99	8.000434	4.500000	0.000434	0.000434	0.000434	0.000434
0.0002	0.000198	0.999802	0.000200	1.000400	1.000400	9998.02	8.000868	4.500000	0.000868	0.000868	0.000868	0.000868
0.0003	0.000297	0.999604	0.000300	1.000700	1.000700	9996.04	8.001302	4.500000	0.001302	0.001302	0.001302	0.001302
0.0004	0.000396	0.999406	0.000400	1.001000	1.001000	9994.06	8.001736	4.500000	0.001736	0.001736	0.001736	0.001736
0.0005	0.000495	0.999208	0.000500	1.001300	1.001300	9992.08	8.002170	4.500000	0.002170	0.002170	0.002170	0.002170
0.0006	0.000594	0.999010	0.000600	1.001600	1.001600	9990.10	8.002604	4.500000	0.002604	0.002604	0.002604	0.002604
0.0007	0.000693	0.998812	0.000700	1.001900	1.001900	9988.12	8.003038	4.500000	0.003038	0.003038	0.003038	0.003038
0.0008	0.000792	0.998614	0.000800	1.002200	1.002200	9986.14	8.003472	4.500000	0.003472	0.003472	0.003472	0.003472
0.0009	0.000891	0.998416	0.000900	1.002500	1.002500	9984.16	8.003906	4.500000	0.003906	0.003906	0.003906	0.003906
0.0010	0.000990	0.998218	0.001000	1.002800	1.002800	9982.18	8.004340	4.500000	0.004340	0.004340	0.004340	0.004340
0.0011	0.001089	0.998020	0.001100	1.003100	1.003100	9980.20	8.004774	4.500000	0.004774	0.004774	0.004774	0.004774
0.0012	0.001188	0.997822	0.001200	1.003400	1.003400	9978.22	8.005208	4.500000	0.005208	0.005208	0.005208	0.005208
0.0013	0.001287	0.997624	0.001300	1.003700	1.003700	9976.24	8.005642	4.500000	0.005642	0.005642	0.005642	0.005642
0.0014	0.001386	0.997426	0.001400	1.004000	1.004000	9974.26	8.006076	4.500000	0.006076	0.006076	0.006076	0.006076
0.0015	0.001485	0.997228	0.001500	1.004300	1.004300	9972.28	8.006510	4.500000	0.006510	0.006510	0.006510	0.006510
0.0016	0.001584	0.997030	0.001600	1.004600	1.004600	9970.30	8.006944	4.500000	0.006944	0.006944	0.006944	0.006944
0.0017	0.001683	0.996832	0.001700	1.004900	1.004900	9968.32	8.007378	4.500000	0.007378	0.007378	0.007378	0.007378
0.0018	0.001782	0.996634	0.001800	1.005200	1.005200	9966.34	8.007812	4.500000	0.007812	0.007812	0.007812	0.007812
0.0019	0.001881	0.996436	0.001900	1.005500	1.005500	9964.36	8.008246	4.500000	0.008246	0.008246	0.008246	0.008246
0.0020	0.001980	0.996238	0.002000	1.005800	1.005800	9962.38	8.008680	4.500000	0.008680	0.008680	0.008680	0.008680
0.0021	0.002079	0.996040	0.002100	1.006100	1.006100	9960.40	8.009114	4.500000	0.009114	0.009114	0.009114	0.009114
0.0022	0.002178	0.995842	0.002200	1.006400	1.006400	9958.42	8.009548	4.500000	0.009548	0.009548	0.009548	0.009548
0.0023	0.002277	0.995644	0.002300	1.006700	1.006700	9956.44	8.009982	4.500000	0.009982	0.009982	0.009982	0.009982
0.0024	0.002376	0.995446	0.002400	1.007000	1.007000	9954.46	8.010416	4.500000	0.010416	0.010416	0.010416	0.010416
0.0025	0.002475	0.995248	0.002500	1.007300	1.007300	9952.48	8.010850	4.500000	0.010850	0.010850	0.010850	0.010850
0.0026	0.002574	0.995050	0.002600	1.007600	1.007600	9950.50	8.011284	4.500000	0.011284	0.011284	0.011284	0.011284
0.0027	0.002673	0.994852	0.002700	1.007900	1.007900	9948.52	8.011718	4.500000	0.011718	0.011718	0.011718	0.011718
0.0028	0.002772	0.994654	0.002800	1.008200	1.008200	9946.54	8.012152	4.500000	0.012152	0.012152	0.012152	0.012152
0.0029	0.002871	0.994456	0.002900	1.008500	1.008500	9944.56	8.012586	4.500000	0.012586	0.012586	0.012586	0.012586
0.0030	0.002970	0.994258	0.003000	1.008800	1.008800	9942.58	8.013020	4.500000	0.013020	0.013020	0.013020	0.013020
0.0031	0.003069	0.994060	0.003100	1.009100	1.009100	9940.60	8.013454	4.500000	0.013454	0.013454	0.013454	0.013454
0.0032	0.003168	0.993862	0.003200	1.009400	1.009400	9938.62	8.013888	4.500000	0.013888	0.013888	0.013888	0.013888
0.0033	0.003267	0.993664	0.003300	1.009700	1.009700	9936.64	8.014322	4.500000	0.014322	0.014322	0.014322	0.014322
0.0034	0.003366	0.993466	0.003400	1.010000	1.010000	9934.66	8.014756	4.500000	0.014756	0.014756	0.014756	0.014756
0.0035	0.003465	0.993268	0.003500	1.010300	1.010300	9932.68	8.015190	4.500000	0.015190	0.015190	0.015190	0.015190
0.0036	0.003564	0.993070	0.003600	1.010600	1.010600	9930.70	8.015624	4.500000	0.015624	0.015624	0.015624	0.015624
0.0037	0.003663	0.992872	0.003700	1.010900	1.010900	9928.72	8.016058	4.500000	0.016058	0.016058	0.016058	0.016058
0.0038	0.003762	0.992674	0.003800	1.011200	1.011200	9926.74	8.016492	4.500000	0.016492	0.016492	0.016492	0.016492
0.0039	0.003861	0.992476	0.003900	1.011500	1.011500	9924.76	8.016926	4.500000	0.016926	0.016926	0.016926	0.016926
0.0040	0.003960	0.992278	0.004000	1.011800	1.011800	9922.78	8.017360	4.500000	0.017360	0.017360	0.017360	0.017360
0.0041	0.004059	0.992080	0.004100	1.012100	1.012100	9920.80	8.017794	4.500000	0.017794	0.017794	0.017794	0.017794
0.0042	0.004158	0.991882	0.004200	1.012400	1.012400	9918.82	8.018228	4.500000	0.018228	0.018228	0.018228	0.018228
0.0043	0.004257	0.991684	0.004300	1.012700	1.012700	9916.84	8.018662	4.500000	0.018662	0.018662	0.018662	0.018662
0.0044	0.004356	0.991486	0.004400	1.013000	1.013000	9914.86	8.019096	4.500000	0.019096	0.019096	0.019096	0.019096
0.0045	0.004455	0.991288	0.004500	1.013300	1.013300	9912.88	8.019530	4.500000	0.019530	0.019530	0.019530	0.019530
0.0046	0.004554	0.991090	0.004600	1.013600	1.013600	9910.90	8.019964	4.500000	0.019964	0.019964	0.019964	0.019964
0.0047	0.004653	0.990892	0.004700	1.013900	1.013900	9908.92	8.020398	4.500000	0.020398	0.020398	0.020398	0.020398
0.0048	0.004752	0.990694	0.004800	1.014200	1.014200	9906.94	8.020832	4.500000	0.020832	0.020832	0.020832	0.020832
0.0049	0.004851	0.990496	0.004900	1.014500	1.014500	9904.96	8.021266	4.500000	0.021266	0.021266	0.021266	0.021266
0.0050	0.004950	0.990298	0.005000	1.014800	1.014800	9902.98	8.021700	4.500000	0.021700	0.021700	0.021700	0.021700
0.0051	0.005049	0.990100	0.005100	1.015100	1.015100	9901.00	8.022134	4.500000	0.022134	0.022134	0.022134	0.022134
0.0052	0.005148	0.989902	0.005200	1.015400	1.015400	9899.02	8.022568	4.500000	0.022568	0.022568	0.022568	0.022568
0.0053	0.005247	0.989704	0.005300	1.015700	1.015700	9897.04	8.023002	4.500000	0.023002	0.023002	0.023002	0.023002
0.0054	0.005346	0.989506	0.005400	1.016000	1.016000	9895.06	8.023436	4.500000	0.023436	0.023436	0.023436	0.023436
0.0055	0.005445	0.989308	0.005500	1.016300	1.016300	9893.08	8.023870	4.500000	0.023870	0.023870	0.023870	0.023870
0.0056	0.005544	0.989110	0.005600	1.016600	1.016600	9891.10	8.024304	4.500000	0.024304	0.024304	0.024304	0.024304
0.0057	0.005643	0.988912	0.005700	1.016900	1.016900	9889.12	8.024738	4.500000	0.024738	0.024738	0.024738	0.024738
0.0058	0.005742	0.988714	0.005800	1.017200	1.017200	9887.14	8.025172	4.500000	0.025172	0.025172	0.025172	0.025172
0.0059	0.005841	0.988516	0.005900	1.017500	1.017500	9885.16	8.025606	4.500000	0.025606	0.025606	0.025606	0.025606
0.0060	0.005940	0.988318	0.006000	1.017800	1.017800	9883.18	8.026040	4.500000	0.026040	0.026040	0.026040	0.026040
0.0061	0.006039	0.988120	0.006100	1.018100	1.018100	9881.20	8.026474	4.500000	0.026474	0.026474	0.026474	0.026474
0.0062	0.006138	0.987922	0.006200	1.018400	1.018400	9879.22	8.026908	4.500000	0.026908	0.026908	0.026908	0.026908
0.0063	0.006237	0.987724	0.006300	1.018700	1.018700	9877.24	8.027342	4.500000	0.027342	0.027342	0.027342	0.027342
0.0064	0.006336	0.987526	0.006400	1.019000	1.019000	9875.26	8.027776	4.500000	0.027776	0.027776	0.027776	0.027776
0.0065	0.006435	0.987328	0.006500	1.019300	1.019300	9873.28	8.028210	4.500000	0.028210	0.028210	0.028210	0.028210
0.0066	0.006534	0.987130	0.006600	1.019600	1.019600	9871.30	8.028644	4.500000	0.028644	0.028644	0.028644	0.028644
0.0067	0.006633	0.986932	0.006700	1.019900	1.019900	9869.32	8.029078	4.500000	0.029078	0.029078	0.029078	0.029078
0.0068	0.006732	0.986734	0.006800	1.020200	1.020200	9867.34	8.029512	4.500000	0.029512	0.029512	0.029512	0.029512
0.0069	0.006831	0.986536	0.006900	1.020500	1.020500	9865.36	8.029946	4.500000	0.029946	0.029946	0.029946	0.029946
0.0070	0.006930	0.986338	0.007000	1.020800	1.020800	9863.38	8.030380	4.500000	0.0303			

Circular Functions.

u	$\sin u$	$\sin u'$	$\cos u$	$\cos u'$	$\log \sin u$	$\log \sin u'$	$\log \cos u$	$\log \cos u'$	u
0.100	0.09983	99.5	0.99500	10.0	8.00028	433.8	9.00782	4.4	5 43' 46.48
.101	.10083	99.5	.99490	10.1	8.00158	438.5	.99778	4.4	5 47' 14.75
.102	.10181	99.5	.99480	10.2	.00785	443.3	.99774	4.4	5 50' 30.61
.103	.10282	99.5	.99470	10.3	.01207	448.2	.99769	4.5	5 54' 05.28
.104	.10381	99.5	.99460	10.4	.01635	453.1	.99765	4.5	5 57' 31.54
0.105	0.10481	99.4	0.99449	10.5	0.02039	458.1	9.99760	4.6	6 00' 57.80
.106	.10580	99.4	.99439	10.6	.02440	463.2	.99756	4.6	6 04' 24.07
.107	.10680	99.4	.99428	10.7	.02855	468.3	.99751	4.7	6 07' 50.33
.108	.10779	99.4	.99417	10.8	.03258	473.6	.99746	4.7	6 11' 16.60
.109	.10878	99.4	.99407	10.9	.03657	479.0	.99741	4.8	6 14' 42.86
0.110	0.10978	99.4	0.99396	11.0	0.04052	484.3	9.99737	4.8	6 18' 09.13
.111	.11077	99.4	.99385	11.1	.04443	489.6	.99732	4.8	6 21' 35.39
.112	.11177	99.4	.99373	11.2	.04831	495.1	.99727	4.9	6 25' 01.66
.113	.11276	99.4	.99362	11.3	.05215	499.7	.99722	4.9	6 28' 27.92
.114	.11375	99.4	.99351	11.4	.05596	505.3	.99717	5.0	6 31' 54.19
0.115	0.11475	99.3	0.99339	11.5	0.05974	510.9	9.99712	5.0	6 35' 20.45
.116	.11574	99.3	.99328	11.6	.06348	516.6	.99707	5.1	6 38' 46.72
.117	.11673	99.3	.99316	11.7	.06719	522.3	.99702	5.1	6 42' 12.98
.118	.11773	99.3	.99305	11.8	.07087	528.1	.99697	5.1	6 45' 39.25
.119	.11872	99.3	.99293	11.9	.07452	533.9	.99692	5.2	6 49' 05.51
0.120	0.11971	99.3	0.99281	12.0	0.07814	539.8	9.99687	5.2	6 52' 31.78
.121	.12070	99.3	.99270	12.1	.08173	545.7	.99681	5.3	6 55' 58.04
.122	.12169	99.3	.99257	12.2	.08538	551.7	.99676	5.3	6 59' 24.31
.123	.12269	99.2	.99245	12.3	.08898	557.8	.99671	5.4	7 02' 50.57
.124	.12368	99.2	.99232	12.4	.09253	563.9	.99666	5.4	7 06' 16.84
0.125	0.12467	99.2	0.99220	12.5	0.09608	570.0	9.99660	5.5	7 09' 43.10
.126	.12567	99.2	.99207	12.6	.09962	576.2	.99654	5.5	7 13' 09.37
.127	.12666	99.2	.99195	12.7	.10314	582.5	.99649	5.5	7 16' 35.63
.128	.12765	99.2	.99182	12.8	.10662	588.8	.99643	5.6	7 20' 01.90
.129	.12864	99.2	.99169	12.9	.11008	595.2	.99638	5.6	7 23' 28.16
0.130	0.12963	99.2	0.99156	13.0	0.11352	601.7	9.99632	5.7	7 26' 54.42
.131	.13063	99.1	.99143	13.1	.11693	608.3	.99626	5.7	7 30' 20.69
.132	.13162	99.1	.99130	13.2	.12031	614.9	.99621	5.8	7 33' 46.95
.133	.13261	99.1	.99117	13.3	.12357	621.6	.99615	5.8	7 37' 13.22
.134	.13360	99.1	.99104	13.4	.12680	628.3	.99609	5.9	7 40' 39.48
0.135	0.13459	99.1	0.99090	13.5	0.13001	635.1	9.99603	5.9	7 44' 05.75
.136	.13558	99.1	.99077	13.6	.13320	641.9	.99597	5.9	7 47' 32.01
.137	.13657	99.1	.99063	13.7	.13636	648.8	.99591	6.0	7 50' 58.28
.138	.13756	99.0	.99049	13.8	.13950	655.8	.99585	6.0	7 54' 24.54
.139	.13855	99.0	.99036	13.9	.14262	662.9	.99579	6.1	7 57' 50.81
0.140	0.13954	99.0	0.99022	14.0	0.14571	670.1	9.99573	6.1	8 01' 17.07
.141	.14053	99.0	.99008	14.1	.14878	677.3	.99567	6.2	8 04' 43.34
.142	.14152	99.0	.98993	14.2	.15183	684.6	.99561	6.2	8 08' 09.60
.143	.14251	99.0	.98979	14.3	.15485	692.0	.99554	6.3	8 11' 35.87
.144	.14350	99.0	.98965	14.4	.15786	699.5	.99548	6.3	8 15' 02.13
0.145	0.14449	99.0	0.98951	14.5	0.16085	707.1	9.99542	6.3	8 18' 28.40
.146	.14548	99.0	.98936	14.6	.16381	714.8	.99535	6.4	8 21' 54.66
.147	.14647	99.0	.98921	14.7	.16675	722.6	.99529	6.4	8 25' 20.93
.148	.14746	99.0	.98907	14.8	.16968	730.5	.99523	6.5	8 28' 47.19
.149	.14845	99.0	.98892	14.9	.17258	738.5	.99516	6.5	8 32' 13.46
0.150	0.14944	99.0	0.98877	15.0	0.17546	746.6	9.99510	6.6	8 35' 39.72
u	$-\sin u$	$\sin u'$	$\cos u$	$\cos u'$	$\log \sinh u$	$\log \sinh u'$	$\log \cosh u$	$\log \cosh u'$	u

Circular Functions.

u	$\sin u$	$\cos u$	$\tan u$	$\cot u$	$\sec u$	$\csc u$	$\log \sin u$	$\log \cos u$	$\log \tan u$	$\log \cot u$	$\log \sec u$	$\log \csc u$
0.130	0.12914	0.98927	1.40	0.71429	1.40	0.71429	9.08927	9.98927	0.71429	0.08927	0.08927	0.08927
0.131	0.13043	0.98892	1.40	0.71429	1.40	0.71429	9.09056	9.98892	0.71429	0.09056	0.08892	0.08892
0.132	0.13172	0.98857	1.41	0.71429	1.41	0.71429	9.09185	9.98857	0.71429	0.09185	0.08857	0.08857
0.133	0.13301	0.98822	1.41	0.71429	1.41	0.71429	9.09314	9.98822	0.71429	0.09314	0.08822	0.08822
0.134	0.13430	0.98787	1.41	0.71429	1.41	0.71429	9.09443	9.98787	0.71429	0.09443	0.08787	0.08787
0.135	0.13559	0.98752	1.42	0.71429	1.42	0.71429	9.09572	9.98752	0.71429	0.09572	0.08752	0.08752
0.136	0.13688	0.98717	1.42	0.71429	1.42	0.71429	9.09701	9.98717	0.71429	0.09701	0.08717	0.08717
0.137	0.13817	0.98682	1.42	0.71429	1.42	0.71429	9.09830	9.98682	0.71429	0.09830	0.08682	0.08682
0.138	0.13946	0.98647	1.43	0.71429	1.43	0.71429	9.09959	9.98647	0.71429	0.09959	0.08647	0.08647
0.139	0.14075	0.98612	1.43	0.71429	1.43	0.71429	9.10088	9.98612	0.71429	0.10088	0.08612	0.08612
0.140	0.14204	0.98577	1.43	0.71429	1.43	0.71429	9.10217	9.98577	0.71429	0.10217	0.08577	0.08577
0.141	0.14333	0.98542	1.44	0.71429	1.44	0.71429	9.10346	9.98542	0.71429	0.10346	0.08542	0.08542
0.142	0.14462	0.98507	1.44	0.71429	1.44	0.71429	9.10475	9.98507	0.71429	0.10475	0.08507	0.08507
0.143	0.14591	0.98472	1.44	0.71429	1.44	0.71429	9.10604	9.98472	0.71429	0.10604	0.08472	0.08472
0.144	0.14720	0.98437	1.45	0.71429	1.45	0.71429	9.10733	9.98437	0.71429	0.10733	0.08437	0.08437
0.145	0.14849	0.98402	1.45	0.71429	1.45	0.71429	9.10862	9.98402	0.71429	0.10862	0.08402	0.08402
0.146	0.14978	0.98367	1.45	0.71429	1.45	0.71429	9.10991	9.98367	0.71429	0.10991	0.08367	0.08367
0.147	0.15107	0.98332	1.46	0.71429	1.46	0.71429	9.11120	9.98332	0.71429	0.11120	0.08332	0.08332
0.148	0.15236	0.98297	1.46	0.71429	1.46	0.71429	9.11249	9.98297	0.71429	0.11249	0.08297	0.08297
0.149	0.15365	0.98262	1.46	0.71429	1.46	0.71429	9.11378	9.98262	0.71429	0.11378	0.08262	0.08262
0.150	0.15494	0.98227	1.47	0.71429	1.47	0.71429	9.11507	9.98227	0.71429	0.11507	0.08227	0.08227
0.151	0.15623	0.98192	1.47	0.71429	1.47	0.71429	9.11636	9.98192	0.71429	0.11636	0.08192	0.08192
0.152	0.15752	0.98157	1.47	0.71429	1.47	0.71429	9.11765	9.98157	0.71429	0.11765	0.08157	0.08157
0.153	0.15881	0.98122	1.48	0.71429	1.48	0.71429	9.11894	9.98122	0.71429	0.11894	0.08122	0.08122
0.154	0.16010	0.98087	1.48	0.71429	1.48	0.71429	9.12023	9.98087	0.71429	0.12023	0.08087	0.08087
0.155	0.16139	0.98052	1.48	0.71429	1.48	0.71429	9.12152	9.98052	0.71429	0.12152	0.08052	0.08052
0.156	0.16268	0.98017	1.49	0.71429	1.49	0.71429	9.12281	9.98017	0.71429	0.12281	0.08017	0.08017
0.157	0.16397	0.97982	1.49	0.71429	1.49	0.71429	9.12410	9.97982	0.71429	0.12410	0.07982	0.07982
0.158	0.16526	0.97947	1.49	0.71429	1.49	0.71429	9.12539	9.97947	0.71429	0.12539	0.07947	0.07947
0.159	0.16655	0.97912	1.50	0.71429	1.50	0.71429	9.12668	9.97912	0.71429	0.12668	0.07912	0.07912
0.160	0.16784	0.97877	1.50	0.71429	1.50	0.71429	9.12797	9.97877	0.71429	0.12797	0.07877	0.07877
0.161	0.16913	0.97842	1.50	0.71429	1.50	0.71429	9.12926	9.97842	0.71429	0.12926	0.07842	0.07842
0.162	0.17042	0.97807	1.51	0.71429	1.51	0.71429	9.13055	9.97807	0.71429	0.13055	0.07807	0.07807
0.163	0.17171	0.97772	1.51	0.71429	1.51	0.71429	9.13184	9.97772	0.71429	0.13184	0.07772	0.07772
0.164	0.17300	0.97737	1.51	0.71429	1.51	0.71429	9.13313	9.97737	0.71429	0.13313	0.07737	0.07737
0.165	0.17429	0.97702	1.52	0.71429	1.52	0.71429	9.13442	9.97702	0.71429	0.13442	0.07702	0.07702
0.166	0.17558	0.97667	1.52	0.71429	1.52	0.71429	9.13571	9.97667	0.71429	0.13571	0.07667	0.07667
0.167	0.17687	0.97632	1.52	0.71429	1.52	0.71429	9.13700	9.97632	0.71429	0.13700	0.07632	0.07632
0.168	0.17816	0.97597	1.53	0.71429	1.53	0.71429	9.13829	9.97597	0.71429	0.13829	0.07597	0.07597
0.169	0.17945	0.97562	1.53	0.71429	1.53	0.71429	9.13958	9.97562	0.71429	0.13958	0.07562	0.07562
0.170	0.18074	0.97527	1.53	0.71429	1.53	0.71429	9.14087	9.97527	0.71429	0.14087	0.07527	0.07527
0.171	0.18203	0.97492	1.54	0.71429	1.54	0.71429	9.14216	9.97492	0.71429	0.14216	0.07492	0.07492
0.172	0.18332	0.97457	1.54	0.71429	1.54	0.71429	9.14345	9.97457	0.71429	0.14345	0.07457	0.07457
0.173	0.18461	0.97422	1.54	0.71429	1.54	0.71429	9.14474	9.97422	0.71429	0.14474	0.07422	0.07422
0.174	0.18590	0.97387	1.55	0.71429	1.55	0.71429	9.14603	9.97387	0.71429	0.14603	0.07387	0.07387
0.175	0.18719	0.97352	1.55	0.71429	1.55	0.71429	9.14732	9.97352	0.71429	0.14732	0.07352	0.07352
0.176	0.18848	0.97317	1.55	0.71429	1.55	0.71429	9.14861	9.97317	0.71429	0.14861	0.07317	0.07317
0.177	0.18977	0.97282	1.56	0.71429	1.56	0.71429	9.14990	9.97282	0.71429	0.14990	0.07282	0.07282
0.178	0.19106	0.97247	1.56	0.71429	1.56	0.71429	9.15119	9.97247	0.71429	0.15119	0.07247	0.07247
0.179	0.19235	0.97212	1.56	0.71429	1.56	0.71429	9.15248	9.97212	0.71429	0.15248	0.07212	0.07212
0.180	0.19364	0.97177	1.57	0.71429	1.57	0.71429	9.15377	9.97177	0.71429	0.15377	0.07177	0.07177
0.181	0.19493	0.97142	1.57	0.71429	1.57	0.71429	9.15506	9.97142	0.71429	0.15506	0.07142	0.07142
0.182	0.19622	0.97107	1.57	0.71429	1.57	0.71429	9.15635	9.97107	0.71429	0.15635	0.07107	0.07107
0.183	0.19751	0.97072	1.58	0.71429	1.58	0.71429	9.15764	9.97072	0.71429	0.15764	0.07072	0.07072
0.184	0.19880	0.97037	1.58	0.71429	1.58	0.71429	9.15893	9.97037	0.71429	0.15893	0.07037	0.07037
0.185	0.20009	0.97002	1.58	0.71429	1.58	0.71429	9.16022	9.97002	0.71429	0.16022	0.07002	0.07002
0.186	0.20138	0.96967	1.59	0.71429	1.59	0.71429	9.16151	9.96967	0.71429	0.16151	0.06967	0.06967
0.187	0.20267	0.96932	1.59	0.71429	1.59	0.71429	9.16280	9.96932	0.71429	0.16280	0.06932	0.06932
0.188	0.20396	0.96897	1.59	0.71429	1.59	0.71429	9.16409	9.96897	0.71429	0.16409	0.06897	0.06897
0.189	0.20525	0.96862	1.60	0.71429	1.60	0.71429	9.16538	9.96862	0.71429	0.16538	0.06862	0.06862
0.190	0.20654	0.96827	1.60	0.71429	1.60	0.71429	9.16667	9.96827	0.71429	0.16667	0.06827	0.06827
0.191	0.20783	0.96792	1.60	0.71429	1.60	0.71429	9.16796	9.96792	0.71429	0.16796	0.06792	0.06792
0.192	0.20912	0.96757	1.61	0.71429	1.61	0.71429	9.16925	9.96757	0.71429	0.16925	0.06757	0.06757
0.193	0.21041	0.96722	1.61	0.71429	1.61	0.71429	9.17054	9.96722	0.71429	0.17054	0.06722	0.06722
0.194	0.21170	0.96687	1.61	0.71429	1.61	0.71429	9.17183	9.96687	0.71429	0.17183	0.06687	0.06687
0.195	0.21299	0.96652	1.62	0.71429	1.62	0.71429	9.17312	9.96652	0.71429	0.17312	0.06652	0.06652
0.196	0.21428	0.96617	1.62	0.71429	1.62	0.71429	9.17441	9.96617	0.71429	0.17441	0.06617	0.06617
0.197	0.21557	0.96582	1.62	0.71429	1.62	0.71429	9.17570	9.96582	0.71429	0.17570	0.06582	0.06582
0.198	0.21686	0.96547	1.63	0.71429	1.63	0.71429	9.17699	9.96547	0.71429	0.17699	0.06547	0.06547
0.199	0.21815	0.96512	1.63	0.71429	1.63	0.71429	9.17828	9.96512	0.71429	0.17828	0.06512	0.06512
0.200	0.21944	0.96477	1.63	0.71429	1.63	0.71429	9.17957	9.96477	0.71429	0.17957	0.06477	0.06477
0.201	0.22073	0.96442	1.64	0.71429	1.64	0.71429	9.18086	9.96442	0.71429	0.18086	0.06442	0.06442
0.202	0.22202	0.96407	1.64	0.71429	1.64	0.71429	9.18215	9.96407	0.71429	0.18215	0.06407	0.06407
0.203	0.22331	0.96372	1.64	0.71429	1.64	0.71429	9.18344	9.96372	0.71429	0.18344	0.06372	0.06372
0.204	0.22460	0.96337	1.65	0.71429	1.65	0.71429	9.18473	9.96337	0.71429	0.18473	0.06337	0.06337
0.205	0.22589	0.96302	1.65	0.71429	1.65	0.71429	9.18602	9.96302	0.71429	0.18602	0.06302	0.06302
0.206	0.22718	0.96267	1.65	0.71429	1.65	0.71429	9.18731	9.96267	0.71429	0.18731	0.06267	0.06267
0.207	0.22847	0.96232	1.66	0.71429	1.66	0.71429	9.18860	9.96232	0.71429	0.18860	0.06232	0.06232
0.208	0.22976	0.96197	1.66	0.71429	1.66	0.71429	9.18989	9.96197	0.71429	0.18989	0.06197	0.06197

Circular Functions.

u	$\sin u$	$\cos u$	$\tan u$	$\cot u$	$\sec u$	$\csc u$	$\log \sin u$	$\log \cos u$	$\log \tan u$	u
0.200	0.19867	0.98007	19.9	0.05015	1.01017	1.01017	9.99126	8.8	11 27 32.96	
.201	0.19965	0.97987	20.0	0.05037	1.01017	1.01017	9.99117	8.8	11 30 39.33	
.202	0.20063	0.97967	20.1	0.05059	1.01017	1.01017	9.99108	8.0	11 34 25.49	
.203	0.20161	0.97947	20.2	0.05081	1.01017	1.01017	9.99099	8.0	11 37 51.76	
.204	0.20259	0.97926	20.3	0.05103	1.01017	1.01017	9.99090	9.0	11 41 18.02	
0.205	0.20357	0.97906	20.4	0.05125	1.01017	1.01017	9.99081	9.0	11 44 44.20	
.206	0.20455	0.97885	20.5	0.05147	1.01017	1.01017	9.99072	9.1	11 48 10.55	
.207	0.20552	0.97865	20.6	0.05169	1.01017	1.01017	9.99063	9.1	11 51 36.81	
.208	0.20650	0.97845	20.7	0.05191	1.01017	1.01017	9.99054	9.2	11 55 03.08	
.209	0.20748	0.97824	20.8	0.05213	1.01017	1.01017	9.99044	9.2	11 58 29.34	
0.210	0.20846	0.97803	20.9	0.05235	1.01017	1.01017	9.99035	9.3	12 01 55.61	
.211	0.20944	0.97782	21.0	0.05257	1.01017	1.01017	9.99026	9.3	12 05 21.87	
.212	0.21042	0.97761	21.1	0.05279	1.01017	1.01017	9.99017	9.3	12 08 48.14	
.213	0.21139	0.97740	21.2	0.05301	1.01017	1.01017	9.99008	9.4	12 12 14.40	
.214	0.21237	0.97719	21.3	0.05323	1.01017	1.01017	9.99008	9.4	12 15 40.67	
0.215	0.21335	0.97698	21.4	0.05345	1.01017	1.01017	9.99008	9.5	12 19 06.93	
.216	0.21433	0.97676	21.5	0.05367	1.01017	1.01017	9.99009	9.5	12 22 33.20	
.217	0.21530	0.97655	21.6	0.05389	1.01017	1.01017	9.99009	9.6	12 25 59.46	
.218	0.21628	0.97633	21.7	0.05411	1.01017	1.01017	9.99009	9.6	12 29 25.73	
.219	0.21726	0.97612	21.8	0.05433	1.01017	1.01017	9.99009	9.7	12 32 51.99	
0.220	0.21823	0.97590	21.9	0.05455	1.01017	1.01017	9.99009	9.7	12 36 18.26	
.221	0.21921	0.97568	22.0	0.05477	1.01017	1.01017	9.99009	9.8	12 39 44.52	
.222	0.22018	0.97546	22.1	0.05499	1.01017	1.01017	9.99009	9.8	12 43 10.79	
.223	0.22116	0.97524	22.2	0.05521	1.01017	1.01017	9.99009	9.8	12 46 37.05	
.224	0.22213	0.97502	22.3	0.05543	1.01017	1.01017	9.99009	9.9	12 50 03.32	
0.225	0.22311	0.97479	22.4	0.05565	1.01017	1.01017	9.99009	9.9	12 53 29.58	
.226	0.22408	0.97457	22.5	0.05587	1.01017	1.01017	9.99009	10.0	12 56 55.85	
.227	0.22506	0.97435	22.6	0.05609	1.01017	1.01017	9.99009	10.0	13 00 22.11	
.228	0.22603	0.97412	22.7	0.05631	1.01017	1.01017	9.99009	10.1	13 03 48.38	
.229	0.22700	0.97390	22.8	0.05653	1.01017	1.01017	9.99009	10.1	13 07 14.64	
0.230	0.22798	0.97367	22.9	0.05675	1.01017	1.01017	9.99009	10.2	13 10 40.91	
.231	0.22895	0.97344	23.0	0.05697	1.01017	1.01017	9.99009	10.2	13 14 07.17	
.232	0.22992	0.97321	23.1	0.05719	1.01017	1.01017	9.99009	10.3	13 17 33.44	
.233	0.23090	0.97298	23.2	0.05741	1.01017	1.01017	9.99009	10.3	13 20 59.70	
.234	0.23187	0.97275	23.3	0.05763	1.01017	1.01017	9.99009	10.4	13 24 25.96	
0.235	0.23284	0.97252	23.4	0.05785	1.01017	1.01017	9.99009	10.4	13 27 52.23	
.236	0.23382	0.97229	23.5	0.05807	1.01017	1.01017	9.99009	10.4	13 31 18.49	
.237	0.23479	0.97206	23.6	0.05829	1.01017	1.01017	9.99009	10.5	13 34 44.76	
.238	0.23576	0.97183	23.7	0.05851	1.01017	1.01017	9.99009	10.5	13 38 11.02	
.239	0.23673	0.97160	23.8	0.05873	1.01017	1.01017	9.99009	10.6	13 41 37.29	
0.240	0.23770	0.97137	23.9	0.05895	1.01017	1.01017	9.99009	10.6	13 45 03.55	
.241	0.23867	0.97114	24.0	0.05917	1.01017	1.01017	9.99009	10.7	13 48 29.82	
.242	0.23964	0.97091	24.1	0.05939	1.01017	1.01017	9.99009	10.7	13 51 56.08	
.243	0.24062	0.97068	24.2	0.05961	1.01017	1.01017	9.99009	10.8	13 55 22.35	
.244	0.24159	0.97045	24.3	0.05983	1.01017	1.01017	9.99009	10.8	13 58 48.61	
0.245	0.24256	0.97022	24.4	0.06005	1.01017	1.01017	9.99009	10.9	14 02 14.88	
.246	0.24353	0.97000	24.5	0.06027	1.01017	1.01017	9.99009	10.9	14 05 41.14	
.247	0.24450	0.96977	24.6	0.06049	1.01017	1.01017	9.99009	11.0	14 09 07.41	
.248	0.24547	0.96954	24.7	0.06071	1.01017	1.01017	9.99009	11.0	14 12 33.67	
.249	0.24643	0.96931	24.8	0.06093	1.01017	1.01017	9.99009	11.0	14 15 59.94	
0.250	0.24740	0.96908	24.9	0.06115	1.01017	1.01017	9.99009	11.1	14 19 26.20	
u	$-\sin u$	$\cos u$	$\tan u$	$\cot u$	$\sec u$	$\csc u$	$\log \sin u$	$\log \cos u$	$\log \tan u$	u

Circular Functions.

u	$\sin u$	$= F_1'$	$\cos u$	$= F_2'$	$\log \sin u$	$= F_3'$	$\log \cos u$	$= F_4'$	u
0.300	0.29552	05.5	0.95534	20.6	9.47099	140.4	9.58016	13.4	17 11 19.44
.301	.29668	05.5	.95504	20.6	.47199	139.9	.58002	13.5	17 12 45.71
.302	.29741	05.5	.95474	20.7	.47300	139.4	.57980	13.5	17 13 11.57
.303	.29813	05.4	.95445	20.8	.47400	138.9	.57957	13.6	17 21 38.24
.304	.29934	05.4	.95415	20.9	.47616	138.4	.57932	13.6	17 23 04.50
0.305	0.30029	05.4	0.95385	30.0	0.47755	137.9	0.57908	13.7	17 28 30.77
.306	.30125	05.4	.95355	30.1	.47892	137.5	.57884	13.7	17 31 57.03
.307	.30220	05.3	.95324	30.2	.48029	137.0	.57860	13.8	17 35 23.30
.308	.30315	05.3	.95294	30.3	.48166	136.5	.57837	13.8	17 38 49.56
.309	.30411	05.3	.95264	30.4	.48303	136.0	.57813	13.9	17 42 15.83
0.310	0.30506	05.2	0.95233	30.5	0.48438	135.6	0.57789	13.9	17 45 42.09
.311	.30601	05.2	.95203	30.6	.48574	135.1	.57765	14.0	17 49 08.35
.312	.30696	05.2	.95172	30.7	.48709	134.7	.57741	14.0	17 52 34.62
.313	.30791	05.1	.95141	30.8	.48843	134.2	.57717	14.1	17 56 00.88
.314	.30887	05.1	.95111	30.9	.48977	133.7	.57693	14.1	17 59 27.15
0.315	0.30982	05.1	0.95080	31.0	0.49110	133.3	0.57669	14.2	18 02 53.41
.316	.31077	05.0	.95049	31.1	.49244	132.8	.57645	14.2	18 06 19.68
.317	.31172	05.0	.95017	31.2	.49378	132.4	.57621	14.2	18 09 45.94
.318	.31267	05.0	.94986	31.3	.49509	131.9	.57597	14.2	18 13 12.21
.319	.31362	05.0	.94955	31.4	.49640	131.5	.57572	14.3	18 16 38.47
0.320	0.31457	04.9	0.94924	31.5	0.49771	131.1	0.57548	14.4	18 20 04.74
.321	.31552	04.9	.94892	31.6	.49902	130.6	.57523	14.4	18 23 31.00
.322	.31646	04.9	.94860	31.6	.50032	130.2	.57499	14.5	18 26 57.27
.323	.31741	04.8	.94829	31.7	.50162	129.7	.57474	14.5	18 30 23.53
.324	.31836	04.8	.94797	31.8	.50292	129.3	.57450	14.6	18 33 49.80
0.325	0.31931	04.8	0.94766	31.9	0.50421	128.9	0.57425	14.6	18 37 16.06
.326	.32025	04.7	.94733	32.0	.50550	128.5	.57401	14.7	18 40 42.33
.327	.32120	04.7	.94701	32.1	.50678	128.0	.57376	14.7	18 44 08.59
.328	.32215	04.7	.94669	32.2	.50806	127.6	.57352	14.8	18 47 34.85
.329	.32310	04.6	.94637	32.3	.50933	127.2	.57327	14.8	18 51 01.12
0.330	0.32404	04.6	0.94604	32.4	0.51060	126.8	0.57302	14.9	18 54 27.39
.331	.32499	04.6	.94572	32.5	.51187	126.4	.57277	14.9	18 57 53.65
.332	.32593	04.5	.94540	32.6	.51313	126.0	.57252	15.0	19 01 19.92
.333	.32688	04.5	.94507	32.7	.51439	125.6	.57227	15.0	19 04 46.18
.334	.32782	04.5	.94474	32.8	.51564	125.2	.57202	15.1	19 08 12.45
0.335	0.32877	04.4	0.94441	32.9	0.51689	124.8	0.57177	15.1	19 11 38.71
.336	.32971	04.4	.94408	33.0	.51814	124.4	.57152	15.2	19 15 04.97
.337	.33066	04.4	.94375	33.1	.51938	124.0	.57127	15.2	19 18 31.24
.338	.33160	04.3	.94342	33.2	.52062	123.6	.57102	15.3	19 21 57.50
.339	.33254	04.3	.94309	33.3	.52185	123.2	.57077	15.3	19 25 23.77
0.340	0.33349	04.3	0.94275	33.3	0.52308	122.8	0.57052	15.4	19 28 50.03
.341	.33443	04.2	.94242	33.4	.52430	122.4	.57027	15.4	19 32 16.30
.342	.33537	04.2	.94209	33.5	.52553	122.0	.56999	15.5	19 35 42.56
.343	.33631	04.2	.94175	33.6	.52676	121.6	.56974	15.5	19 39 08.83
.344	.33725	04.1	.94141	33.7	.52799	121.2	.56948	15.6	19 42 35.09
0.345	0.33820	04.1	0.94108	33.8	0.52917	120.8	0.56923	15.6	19 46 01.36
.346	.33914	04.1	.94074	33.9	.53038	120.5	.56897	15.7	19 49 27.62
.347	.34008	04.0	.94040	34.0	.53158	120.1	.56871	15.7	19 52 53.88
.348	.34102	04.0	.94006	34.1	.53278	119.7	.56845	15.8	19 56 20.15
.349	.34196	04.0	.93972	34.2	.53397	119.3	.56819	15.8	19 59 46.42
0.350	0.34290	03.9	0.93937	34.3	0.53516	119.0	0.56794	15.9	20 03 12.68
u	$= 1 \text{ inch}$	$= F_1'$	$\cos u$	$= F_2'$	$\log \sin u$	$= F_3'$	$\log \cos u$	$= F_4'$	u

Circular Functions.

u	$\sin u$	$\cos u$	$\tan u$	$\cot u$	$\sec u$	$\csc u$	$\log \sin u$	$\log \cos u$	$\log \tan u$	$\log \cot u$	$\log \sec u$	$\log \csc u$
0.150	0.1494	0.9890	0.0151	66.22	1.0151	1.0000	9.1734	9.9984	0.0254	9.9746	0.0016	0.0000
0.151	0.1499	0.9889	0.0152	66.18	1.0152	1.0000	9.1740	9.9983	0.0258	9.9742	0.0016	0.0000
0.152	0.1504	0.9888	0.0153	66.14	1.0153	1.0000	9.1746	9.9982	0.0262	9.9738	0.0016	0.0000
0.153	0.1509	0.9887	0.0154	66.10	1.0154	1.0000	9.1752	9.9981	0.0266	9.9734	0.0016	0.0000
0.154	0.1514	0.9886	0.0155	66.06	1.0155	1.0000	9.1758	9.9980	0.0270	9.9730	0.0016	0.0000
0.155	0.1519	0.9885	0.0156	66.02	1.0156	1.0000	9.1764	9.9979	0.0274	9.9726	0.0016	0.0000
0.156	0.1524	0.9884	0.0157	65.98	1.0157	1.0000	9.1770	9.9978	0.0278	9.9722	0.0016	0.0000
0.157	0.1529	0.9883	0.0158	65.94	1.0158	1.0000	9.1776	9.9977	0.0282	9.9718	0.0016	0.0000
0.158	0.1534	0.9882	0.0159	65.90	1.0159	1.0000	9.1782	9.9976	0.0286	9.9714	0.0016	0.0000
0.159	0.1539	0.9881	0.0160	65.86	1.0160	1.0000	9.1788	9.9975	0.0290	9.9710	0.0016	0.0000
0.160	0.1544	0.9880	0.0161	65.82	1.0161	1.0000	9.1794	9.9974	0.0294	9.9706	0.0016	0.0000
0.161	0.1549	0.9879	0.0162	65.78	1.0162	1.0000	9.1800	9.9973	0.0298	9.9702	0.0016	0.0000
0.162	0.1554	0.9878	0.0163	65.74	1.0163	1.0000	9.1806	9.9972	0.0302	9.9698	0.0016	0.0000
0.163	0.1559	0.9877	0.0164	65.70	1.0164	1.0000	9.1812	9.9971	0.0306	9.9694	0.0016	0.0000
0.164	0.1564	0.9876	0.0165	65.66	1.0165	1.0000	9.1818	9.9970	0.0310	9.9690	0.0016	0.0000
0.165	0.1569	0.9875	0.0166	65.62	1.0166	1.0000	9.1824	9.9969	0.0314	9.9686	0.0016	0.0000
0.166	0.1574	0.9874	0.0167	65.58	1.0167	1.0000	9.1830	9.9968	0.0318	9.9682	0.0016	0.0000
0.167	0.1579	0.9873	0.0168	65.54	1.0168	1.0000	9.1836	9.9967	0.0322	9.9678	0.0016	0.0000
0.168	0.1584	0.9872	0.0169	65.50	1.0169	1.0000	9.1842	9.9966	0.0326	9.9674	0.0016	0.0000
0.169	0.1589	0.9871	0.0170	65.46	1.0170	1.0000	9.1848	9.9965	0.0330	9.9670	0.0016	0.0000
0.170	0.1594	0.9870	0.0171	65.42	1.0171	1.0000	9.1854	9.9964	0.0334	9.9666	0.0016	0.0000
0.171	0.1599	0.9869	0.0172	65.38	1.0172	1.0000	9.1860	9.9963	0.0338	9.9662	0.0016	0.0000
0.172	0.1604	0.9868	0.0173	65.34	1.0173	1.0000	9.1866	9.9962	0.0342	9.9658	0.0016	0.0000
0.173	0.1609	0.9867	0.0174	65.30	1.0174	1.0000	9.1872	9.9961	0.0346	9.9654	0.0016	0.0000
0.174	0.1614	0.9866	0.0175	65.26	1.0175	1.0000	9.1878	9.9960	0.0350	9.9650	0.0016	0.0000
0.175	0.1619	0.9865	0.0176	65.22	1.0176	1.0000	9.1884	9.9959	0.0354	9.9646	0.0016	0.0000
0.176	0.1624	0.9864	0.0177	65.18	1.0177	1.0000	9.1890	9.9958	0.0358	9.9642	0.0016	0.0000
0.177	0.1629	0.9863	0.0178	65.14	1.0178	1.0000	9.1896	9.9957	0.0362	9.9638	0.0016	0.0000
0.178	0.1634	0.9862	0.0179	65.10	1.0179	1.0000	9.1902	9.9956	0.0366	9.9634	0.0016	0.0000
0.179	0.1639	0.9861	0.0180	65.06	1.0180	1.0000	9.1908	9.9955	0.0370	9.9630	0.0016	0.0000
0.180	0.1644	0.9860	0.0181	65.02	1.0181	1.0000	9.1914	9.9954	0.0374	9.9626	0.0016	0.0000
0.181	0.1649	0.9859	0.0182	64.98	1.0182	1.0000	9.1920	9.9953	0.0378	9.9622	0.0016	0.0000
0.182	0.1654	0.9858	0.0183	64.94	1.0183	1.0000	9.1926	9.9952	0.0382	9.9618	0.0016	0.0000
0.183	0.1659	0.9857	0.0184	64.90	1.0184	1.0000	9.1932	9.9951	0.0386	9.9614	0.0016	0.0000
0.184	0.1664	0.9856	0.0185	64.86	1.0185	1.0000	9.1938	9.9950	0.0390	9.9610	0.0016	0.0000
0.185	0.1669	0.9855	0.0186	64.82	1.0186	1.0000	9.1944	9.9949	0.0394	9.9606	0.0016	0.0000
0.186	0.1674	0.9854	0.0187	64.78	1.0187	1.0000	9.1950	9.9948	0.0398	9.9602	0.0016	0.0000
0.187	0.1679	0.9853	0.0188	64.74	1.0188	1.0000	9.1956	9.9947	0.0402	9.9598	0.0016	0.0000
0.188	0.1684	0.9852	0.0189	64.70	1.0189	1.0000	9.1962	9.9946	0.0406	9.9594	0.0016	0.0000
0.189	0.1689	0.9851	0.0190	64.66	1.0190	1.0000	9.1968	9.9945	0.0410	9.9590	0.0016	0.0000
0.190	0.1694	0.9850	0.0191	64.62	1.0191	1.0000	9.1974	9.9944	0.0414	9.9586	0.0016	0.0000
0.191	0.1699	0.9849	0.0192	64.58	1.0192	1.0000	9.1980	9.9943	0.0418	9.9582	0.0016	0.0000
0.192	0.1704	0.9848	0.0193	64.54	1.0193	1.0000	9.1986	9.9942	0.0422	9.9578	0.0016	0.0000
0.193	0.1709	0.9847	0.0194	64.50	1.0194	1.0000	9.1992	9.9941	0.0426	9.9574	0.0016	0.0000
0.194	0.1714	0.9846	0.0195	64.46	1.0195	1.0000	9.1998	9.9940	0.0430	9.9570	0.0016	0.0000
0.195	0.1719	0.9845	0.0196	64.42	1.0196	1.0000	9.2004	9.9939	0.0434	9.9566	0.0016	0.0000
0.196	0.1724	0.9844	0.0197	64.38	1.0197	1.0000	9.2010	9.9938	0.0438	9.9562	0.0016	0.0000
0.197	0.1729	0.9843	0.0198	64.34	1.0198	1.0000	9.2016	9.9937	0.0442	9.9558	0.0016	0.0000
0.198	0.1734	0.9842	0.0199	64.30	1.0199	1.0000	9.2022	9.9936	0.0446	9.9554	0.0016	0.0000
0.199	0.1739	0.9841	0.0200	64.26	1.0200	1.0000	9.2028	9.9935	0.0450	9.9550	0.0016	0.0000
0.200	0.1744	0.9840	0.0201	64.22	1.0201	1.0000	9.2034	9.9934	0.0454	9.9546	0.0016	0.0000
0.201	0.1749	0.9839	0.0202	64.18	1.0202	1.0000	9.2040	9.9933	0.0458	9.9542	0.0016	0.0000
0.202	0.1754	0.9838	0.0203	64.14	1.0203	1.0000	9.2046	9.9932	0.0462	9.9538	0.0016	0.0000
0.203	0.1759	0.9837	0.0204	64.10	1.0204	1.0000	9.2052	9.9931	0.0466	9.9534	0.0016	0.0000
0.204	0.1764	0.9836	0.0205	64.06	1.0205	1.0000	9.2058	9.9930	0.0470	9.9530	0.0016	0.0000
0.205	0.1769	0.9835	0.0206	64.02	1.0206	1.0000	9.2064	9.9929	0.0474	9.9526	0.0016	0.0000
0.206	0.1774	0.9834	0.0207	63.98	1.0207	1.0000	9.2070	9.9928	0.0478	9.9522	0.0016	0.0000
0.207	0.1779	0.9833	0.0208	63.94	1.0208	1.0000	9.2076	9.9927	0.0482	9.9518	0.0016	0.0000
0.208	0.1784	0.9832	0.0209	63.90	1.0209	1.0000	9.2082	9.9926	0.0486	9.9514	0.0016	0.0000
0.209	0.1789	0.9831	0.0210	63.86	1.0210	1.0000	9.2088	9.9925	0.0490	9.9510	0.0016	0.0000
0.210	0.1794	0.9830	0.0211	63.82	1.0211	1.0000	9.2094	9.9924	0.0494	9.9506	0.0016	0.0000
0.211	0.1799	0.9829	0.0212	63.78	1.0212	1.0000	9.2100	9.9923	0.0498	9.9502	0.0016	0.0000
0.212	0.1804	0.9828	0.0213	63.74	1.0213	1.0000	9.2106	9.9922	0.0502	9.9498	0.0016	0.0000
0.213	0.1809	0.9827	0.0214	63.70	1.0214	1.0000	9.2112	9.9921	0.0506	9.9494	0.0016	0.0000
0.214	0.1814	0.9826	0.0215	63.66	1.0215	1.0000	9.2118	9.9920	0.0510	9.9490	0.0016	0.0000
0.215	0.1819	0.9825	0.0216	63.62	1.0216	1.0000	9.2124	9.9919	0.0514	9.9486	0.0016	0.0000
0.216	0.1824	0.9824	0.0217	63.58	1.0217	1.0000	9.2130	9.9918	0.0518	9.9482	0.0016	0.0000
0.217	0.1829	0.9823	0.0218	63.54	1.0218	1.0000	9.2136	9.9917	0.0522	9.9478	0.0016	0.0000
0.218	0.1834	0.9822	0.0219	63.50	1.0219	1.0000	9.2142	9.9916	0.0526	9.9474	0.0016	0.0000
0.219	0.1839	0.9821	0.0220	63.46	1.0220	1.0000	9.2148	9.9915	0.0530	9.9470	0.0016	0.0000
0.220	0.1844	0.9820	0.0221	63.42	1.0221	1.0000	9.2154	9.9914	0.0534	9.9466	0.0016	0.0000
0.221	0.1849	0.9819	0.0222	63.38	1.0222	1.0000	9.2160	9.9913	0.0538	9.9462	0.0016	0.0000
0.222	0.1854	0.9818	0.0223	63.34	1.0223	1.0000	9.2166	9.9912	0.0542	9.9458	0.0016	0.0000
0.223	0.1859	0.9817	0.0224	63.30	1.0224	1.0000	9.2172	9.9911	0.0546	9.9454	0.0016	0.0000
0.224	0.1864	0.9816	0.0225	63.26	1.0225	1.0000	9.2178	9.9910	0.0550	9.9450	0.0016	0.0000
0.225	0.1869	0.9815	0.0226	63.22	1.0226	1.0000	9.2184	9.9909	0.0554	9.9446	0.0016	0.0000
0.226	0.1874	0.9814	0.0227	63.18	1.0227	1.0000	9.2190	9.9908	0.0558	9.9442	0.0016	0.0000
0.227	0.1879	0.9813	0.0228	63.14	1.0228	1.0000	9.2196	9.9907	0.0562	9.9438	0.0016	0.0000
0.228	0.1884	0.9812	0.0229	63.10	1.0229	1.0000	9.2202	9.9906	0.0566	9.9434	0.0016	0.0000
0.229	0.1889	0.9811	0.0230	63.06	1.0230	1.0000	9.2208	9.9905	0.0570	9.9430	0.0016	0.0000
0.230	0.1894	0.9810	0.0231	63.02	1.0231	1.0000	9.2214	9.9904	0.0574	9.9426	0.0016	0.0000
0.231	0.1899	0.9809	0.0232	62.98	1.0232	1.0000	9.2220	9.9903	0.0578	9.9422	0.0016	0.0000
0.232	0.1904	0.9808	0.0233	62.94	1.0233	1.0000	9.2226	9.9902	0.0582	9.9418	0.0016	0.0000
0.233	0.1909	0.9807	0.0234</									

Circular Functions.

u	$\sin u$	$\cos u$	$\tan u$	$\cot u$	$\log \sin u$	$\log \cos u$	$\log \tan u$	$\log \cot u$	u
0.400	0.38942	0.92106	38.0	0.50012	102.7	0.95489	18.4	22.55 05.92	
.401	.39034	.92067	39.0	.50144	102.4	.95410	18.4	22.58 32.19	
.402	.39126	.92028	39.1	.50277	102.2	.95332	18.5	23.01 58.45	
.403	.39218	.91989	39.2	.50399	101.9	.95254	18.5	23.05 24.72	
.404	.39310	.91950	39.3	.50450	101.6	.95175	18.6	23.08 50.98	
0.405	0.39402	0.91910	39.4	0.50552	101.3	0.95096	18.6	23.12 17.25	
.406	.39494	.91871	39.5	.50653	101.0	.95018	18.7	23.15 43.51	
.407	.39586	.91831	39.6	.50754	100.7	.94939	18.7	23.19 09.78	
.408	.39677	.91792	39.7	.50854	100.5	.94860	18.8	23.22 36.04	
.409	.39769	.91752	39.8	.50955	100.2	.94782	18.8	23.26 02.31	
0.410	0.39851	0.91712	39.9	0.51055	100.0	0.94703	18.9	23.29 28.57	
.411	.39953	.91672	40.0	.51155	99.9	.94624	18.9	23.32 54.84	
.412	.40044	.91632	40.1	.51254	99.4	.94545	19.0	23.36 21.10	
.413	.40135	.91592	40.2	.51353	99.1	.94466	19.0	23.39 47.36	
.414	.40227	.91552	40.3	.51452	98.8	.94387	19.1	23.43 13.63	
0.415	0.40319	0.91512	40.3	0.51551	98.6	0.94308	19.1	23.46 39.89	
.416	.40410	.91471	40.4	.51649	98.3	.94229	19.2	23.50 06.15	
.417	.40502	.91431	40.5	.51748	98.0	.94150	19.2	23.53 32.42	
.418	.40593	.91390	40.6	.51846	97.8	.94071	19.3	23.56 58.69	
.419	.40685	.91350	40.7	.51943	97.5	.94001	19.3	24.00 24.95	
0.420	0.40776	0.91309	40.8	0.52041	97.3	0.93921	19.4	24.03 51.22	
.421	.40867	.91268	40.9	.52138	97.0	.93842	19.4	24.07 17.48	
.422	.40959	.91227	41.0	.52234	96.7	.93763	19.5	24.10 43.75	
.423	.41050	.91185	41.1	.52331	96.5	.93683	19.6	24.14 10.01	
.424	.41141	.91145	41.2	.52427	96.2	.93603	19.6	24.17 36.28	
0.425	0.41232	0.91104	41.2	0.52524	96.0	0.93524	19.7	24.21 02.54	
.426	.41323	.91063	41.3	.52619	95.7	.93444	19.7	24.24 28.81	
.427	.41414	.91021	41.4	.52715	95.5	.93364	19.8	24.27 55.07	
.428	.41505	.90980	41.5	.52810	95.2	.93284	19.8	24.31 21.34	
.429	.41595	.90938	41.6	.52905	95.0	.93203	19.9	24.34 47.60	
0.430	0.41687	0.90897	41.7	0.53000	94.7	0.93123	19.9	24.38 13.87	
.431	.41778	.90855	41.8	.53095	94.4	.93043	20.0	24.41 40.13	
.432	.41869	.90813	41.9	.53189	94.2	.92963	20.0	24.45 06.40	
.433	.41960	.90771	42.0	.53283	94.0	.92883	20.1	24.48 32.66	
.434	.42050	.90729	42.1	.53377	93.7	.92803	20.1	24.51 58.93	
0.435	0.42141	0.90687	42.1	0.53471	93.5	0.92723	20.2	24.55 25.19	
.436	.42232	.90645	42.2	.53564	93.2	.92643	20.2	24.58 51.46	
.437	.42323	.90603	42.3	.53657	93.0	.92563	20.3	24.62 17.72	
.438	.42413	.90560	42.4	.53750	92.8	.92483	20.3	24.65 43.99	
.439	.42505	.90518	42.5	.53842	92.5	.92403	20.3	24.69 20.25	
0.440	0.42594	0.90475	42.6	0.53935	92.2	0.92323	20.4	24.72 46.51	
.441	.42686	.90433	42.7	.54027	92.0	.92243	20.5	24.76 22.78	
.442	.42777	.90390	42.8	.54119	91.8	.92163	20.5	24.79 49.04	
.443	.42869	.90347	42.9	.54210	91.5	.92083	20.6	24.83 25.31	
.444	.42959	.90304	43.0	.54302	91.3	.92003	20.7	24.86 51.57	
0.445	0.43049	0.90261	43.0	0.54393	91.1	0.91923	20.7	24.90 27.84	
.446	.43139	.90218	43.1	.54484	90.8	.91843	20.8	24.93 54.10	
.447	.43229	.90175	43.2	.54575	90.6	.91763	20.8	24.97 30.37	
.448	.43319	.90132	43.3	.54665	90.4	.91683	20.9	25.00 56.63	
.449	.43409	.90088	43.4	.54755	90.1	.91603	20.9	25.04 32.90	
0.450	0.43497	0.90045	43.5	0.54845	89.9	0.91523	21.0	25.07 59.16	
u	$-\sin u$	$\cos u$	$\tan u$	$\cot u$	$\log \sin u$	$\log \cos u$	$\log \tan u$	$\log \cot u$	u

Circular Functions.

θ	$\sin \theta$	$= F_1'$	$\cos \theta$	$= F_2'$	$\log \sin \theta$	$= F_3'$	$\log \cos \theta$	$= F_4'$	θ
0.150	0.14943	89.0	0.98905	43.5	9.63845	89.0	9.95446	21.0	25 40 29.16
0.151	0.14987	89.0	0.98901	43.5	9.63935	89.7	9.95445	21.0	25 50 25.43
0.152	0.15031	89.0	0.98898	43.7	9.64025	90.4	9.95403	21.1	25 53 51.69
0.153	0.15075	89.0	0.98894	43.9	9.64114	91.2	9.95383	21.1	25 57 17.96
0.154	0.15119	89.0	0.98890	43.9	9.64203	92.0	9.95361	21.2	26 00 44.22
0.155	0.15163	89.0	0.98886	44.0	9.64292	92.8	9.95340	21.2	26 04 10.40
0.156	0.15207	89.0	0.98882	44.0	9.64381	93.5	9.95319	21.3	26 07 36.75
0.157	0.15251	89.7	0.98878	44.1	9.64470	94.3	9.95298	21.4	26 11 03.02
0.158	0.15295	89.7	0.98874	44.2	9.64559	95.1	9.95276	21.4	26 14 29.28
0.159	0.15339	89.0	0.98870	44.3	9.64648	95.9	9.95255	21.5	26 17 55.55
0.160	0.15383	89.0	0.98866	44.4	9.64737	96.7	9.95233	21.5	26 21 21.81
0.161	0.15427	89.0	0.98862	44.5	9.64826	97.5	9.95212	21.5	26 24 48.08
0.162	0.15471	89.5	0.98858	44.6	9.64915	98.3	9.95190	21.6	26 28 14.34
0.163	0.15515	89.5	0.98854	44.7	9.65004	99.1	9.95169	21.7	26 31 40.61
0.164	0.15559	89.1	0.98850	44.8	9.65093	100.0	9.95147	21.7	26 35 06.87
0.165	0.15603	89.1	0.98846	44.8	9.65182	100.8	9.95125	21.8	26 38 33.13
0.166	0.15647	89.3	0.98842	44.9	9.65271	101.6	9.95103	21.8	26 41 59.40
0.167	0.15691	89.3	0.98838	45.0	9.65360	102.4	9.95081	21.9	26 45 25.66
0.168	0.15735	89.3	0.98834	45.1	9.65449	103.2	9.95059	22.0	26 48 51.93
0.169	0.15779	89.3	0.98830	45.2	9.65538	104.0	9.95037	22.0	26 52 18.19
0.170	0.15823	89.1	0.98826	45.3	9.65627	104.8	9.95015	22.1	26 55 44.46
0.171	0.15867	89.1	0.98822	45.4	9.65716	105.6	9.94993	22.1	26 59 10.72
0.172	0.15911	89.1	0.98818	45.5	9.65805	106.4	9.94971	22.2	27 02 36.99
0.173	0.15955	89.0	0.98814	45.6	9.65894	107.2	9.94949	22.2	27 06 03.25
0.174	0.15999	89.0	0.98810	45.6	9.65983	108.0	9.94927	22.3	27 09 29.52
0.175	0.16043	88.9	0.98806	45.7	9.66072	108.8	9.94905	22.3	27 12 55.78
0.176	0.16087	88.9	0.98802	45.8	9.66161	109.6	9.94883	22.4	27 16 22.05
0.177	0.16131	88.8	0.98798	45.9	9.66250	110.4	9.94861	22.4	27 19 48.31
0.178	0.16175	88.8	0.98794	46.0	9.66339	111.2	9.94839	22.5	27 23 14.58
0.179	0.16219	88.7	0.98790	46.1	9.66428	112.0	9.94817	22.5	27 26 40.84
0.180	0.16263	88.7	0.98786	46.1	9.66517	112.8	9.94795	22.6	27 30 07.11
0.181	0.16307	88.7	0.98782	46.3	9.66606	113.6	9.94773	22.6	27 33 33.37
0.182	0.16351	88.6	0.98778	46.4	9.66695	114.4	9.94751	22.7	27 36 59.64
0.183	0.16395	88.6	0.98774	46.5	9.66784	115.2	9.94729	22.8	27 40 25.90
0.184	0.16439	88.5	0.98770	46.6	9.66873	116.0	9.94707	22.8	27 43 52.17
0.185	0.16483	88.5	0.98766	46.6	9.66962	116.8	9.94685	22.9	27 47 18.43
0.186	0.16527	88.4	0.98762	46.7	9.67051	117.6	9.94663	22.9	27 50 44.70
0.187	0.16571	88.4	0.98758	46.8	9.67140	118.4	9.94641	23.0	27 54 10.96
0.188	0.16615	88.3	0.98754	46.9	9.67229	119.2	9.94619	23.1	27 57 37.23
0.189	0.16659	88.3	0.98750	47.0	9.67318	120.0	9.94597	23.1	28 01 03.49
0.190	0.16703	88.2	0.98746	47.1	9.67407	120.8	9.94575	23.2	28 04 29.76
0.191	0.16747	88.2	0.98742	47.2	9.67496	121.6	9.94553	23.2	28 07 56.02
0.192	0.16791	88.1	0.98738	47.3	9.67585	122.4	9.94531	23.3	28 11 22.28
0.193	0.16835	88.1	0.98734	47.4	9.67674	123.2	9.94509	23.3	28 14 48.55
0.194	0.16879	88.0	0.98730	47.5	9.67763	124.0	9.94487	23.4	28 18 14.81
0.195	0.16923	88.0	0.98726	47.6	9.67852	124.8	9.94465	23.4	28 21 41.08
0.196	0.16967	87.9	0.98722	47.6	9.67941	125.6	9.94443	23.5	28 25 07.34
0.197	0.17011	87.9	0.98718	47.7	9.68030	126.4	9.94421	23.6	28 28 33.61
0.198	0.17055	87.9	0.98714	47.8	9.68119	127.2	9.94399	23.6	28 31 59.87
0.199	0.17099	87.8	0.98710	47.9	9.68208	128.0	9.94377	23.7	28 35 26.14
0.200	0.17143	87.8	0.98706	48.0	9.68297	128.8	9.94355	23.7	28 38 52.40
θ	$\sin \theta$	$= F_1'$	$\cos \theta$	$= F_2'$	$\log \sin \theta$	$= F_3'$	$\log \cos \theta$	$= F_4'$	θ

Circular Functions.

u	$\sin u$	$= F_1'$	$\cos u$	$= F_2'$	$\log \sin u$	$= F_3'$	$\log \cos u$	$= F_4'$	u
0.500	0.47943	87.8	0.87758	47.0	9.68072	70.5	9.94329	23.7	28° 38' 52.40
.501	.48030	87.7	.87740	48.0	.68152	70.3	.94305	23.8	28 42 18.67
.502	.48118	87.7	.87662	48.1	.68231	70.1	.94281	23.8	28 45 44.03
.503	.48205	87.6	.87614	48.2	.68310	70.0	.94257	23.9	28 49 11.20
.504	.48293	87.6	.87596	48.3	.68389	70.7	.94233	24.0	28 52 37.46
0.505	0.48381	87.5	0.87517	48.4	9.68467	70.6	9.94209	24.0	28 56 03.73
.506	.48469	87.5	.87499	48.5	.68546	70.4	.94185	24.1	28 59 29.99
.507	.48556	87.4	.87421	48.6	.68624	70.2	.94161	24.1	29 02 56.26
.508	.48643	87.4	.87372	48.6	.68702	70.0	.94137	24.2	29 06 22.52
.509	.48730	87.3	.87323	48.7	.68780	77.8	.94113	24.2	29 09 48.79
0.510	0.48818	87.3	0.87274	48.8	9.68858	77.6	9.94089	24.3	29 13 15.05
.511	.48905	87.2	.87226	48.9	.68935	77.5	.94064	24.3	29 16 41.32
.512	.48992	87.2	.87177	49.0	.69013	77.3	.94040	24.4	29 20 07.58
.513	.49079	87.1	.87128	49.1	.69090	77.1	.94016	24.5	29 23 33.85
.514	.49166	87.1	.87078	49.2	.69167	76.9	.93991	24.5	29 27 00.11
0.515	0.49253	87.0	0.87029	49.3	9.69244	76.7	9.93967	24.6	29 30 26.38
.516	.49340	87.0	.86980	49.3	.69320	76.6	.93942	24.6	29 33 52.64
.517	.49427	86.9	.86931	49.4	.69397	76.4	.93917	24.7	29 37 18.90
.518	.49514	86.9	.86881	49.5	.69473	76.2	.93892	24.8	29 40 45.17
.519	.49601	86.8	.86832	49.6	.69549	76.0	.93868	24.8	29 44 11.43
0.520	0.49688	86.8	0.86782	49.7	9.69625	75.0	9.93843	24.9	29 47 37.70
.521	.49775	86.7	.86732	49.8	.69701	75.7	.93818	24.9	29 51 03.96
.522	.49861	86.7	.86682	49.9	.69777	75.5	.93793	25.0	29 54 30.23
.523	.49948	86.6	.86632	49.9	.69852	75.3	.93768	25.0	29 57 56.49
.524	.50035	86.6	.86582	50.0	.69927	75.2	.93743	25.1	30 01 22.76
0.525	0.50121	86.5	0.86532	50.1	9.70002	75.0	9.93718	25.2	30 04 49.02
.526	.50208	86.5	.86482	50.2	.70077	74.8	.93693	25.2	30 08 15.29
.527	.50294	86.4	.86432	50.3	.70152	74.6	.93667	25.3	30 11 41.55
.528	.50381	86.4	.86382	50.4	.70226	74.5	.93642	25.3	30 15 07.82
.529	.50467	86.3	.86331	50.5	.70301	74.3	.93617	25.4	30 18 34.08
0.530	0.50553	86.3	0.86281	50.6	9.70375	74.1	9.93591	25.4	30 22 00.35
.531	.50640	86.2	.86230	50.6	.70449	74.0	.93566	25.5	30 25 26.61
.532	.50726	86.2	.86179	50.7	.70523	73.8	.93540	25.6	30 28 52.88
.533	.50812	86.1	.86129	50.8	.70597	73.6	.93515	25.6	30 32 19.14
.534	.50898	86.1	.86078	50.9	.70670	73.4	.93489	25.7	30 35 45.41
0.535	0.50984	86.0	0.86027	51.0	9.70743	73.3	9.93463	25.7	30 39 11.67
.536	.51070	86.0	.85976	51.1	.70817	73.1	.93438	25.8	30 42 37.94
.537	.51156	86.0	.85925	51.2	.70890	72.9	.93412	25.9	30 46 04.20
.538	.51242	85.9	.85874	51.2	.70963	72.8	.93386	25.9	30 49 30.47
.539	.51328	85.8	.85822	51.3	.71035	72.6	.93360	26.0	30 52 56.73
0.540	0.51414	85.8	0.85771	51.4	9.71108	72.5	9.93334	26.0	30 56 23.00
.541	.51499	85.7	.85720	51.5	.71180	72.3	.93308	26.1	30 59 49.26
.542	.51585	85.7	.85668	51.6	.71252	72.1	.93282	26.2	31 03 15.52
.543	.51671	85.6	.85616	51.7	.71324	72.0	.93256	26.2	31 06 41.79
.544	.51756	85.6	.85565	51.8	.71396	71.8	.93230	26.3	31 10 08.05
0.545	0.51842	85.5	0.85513	51.8	9.71468	71.6	9.93203	26.3	31 13 34.32
.546	.51927	85.5	.85461	51.9	.71540	71.5	.93177	26.4	31 17 00.58
.547	.52013	85.4	.85409	52.0	.71611	71.3	.93150	26.4	31 20 26.85
.548	.52098	85.4	.85357	52.1	.71682	71.2	.93124	26.5	31 23 53.11
.549	.52183	85.3	.85305	52.2	.71753	71.0	.93097	26.6	31 27 19.38
0.550	0.52269	85.3	0.85252	52.3	9.71824	70.8	9.93071	26.6	31 30 45.64
u	$-1 \sin u$	$= F_1'$	$\csc u$	$= F_2'$	$\log \frac{1}{\sin u}$	$= F_3'$	$\log \csc u$	$= F_4'$	u

Circular Functions.

u	$\sin u$	$\cos u$	$\tan u$	$\cot u$	$\sec u$	$\csc u$	$\log \sin u$	$\log \cos u$	$\log \tan u$	$\log \cot u$	$\log \sec u$	$\log \csc u$	u
0.550	0.52360	0.85232	0.61183	1.63456	1.55907	1.55907	9.71834	9.93071	26.6	31 30 45.64			
.551	.52354	.85200	.61205	1.63405	1.55955	1.55955	.71835	.93074	26.7	31 34 11.91			
.552	.52340	.85148	.61226	1.63355	1.56003	1.56003	.71850	.93077	26.8	31 37 38.17			
.553	.52324	.85095	.61247	1.63305	1.56051	1.56051	.71865	.93081	26.9	31 41 04.44			
.554	.52309	.85043	.61268	1.63255	1.56099	1.56099	.71880	.93084	27.0	31 44 30.70			
0.555	0.52294	0.84990	0.61289	1.63205	1.56147	1.56147	9.72176	9.93237	27.1	31 47 56.97			
.556	.52279	.84937	.61310	1.63155	1.56195	1.56195	.72177	.93240	27.2	31 51 23.23			
.557	.52264	.84884	.61331	1.63105	1.56243	1.56243	.72192	.93243	27.3	31 54 49.50			
.558	.52249	.84832	.61352	1.63055	1.56291	1.56291	.72207	.93246	27.4	31 58 15.76			
.559	.52234	.84779	.61373	1.63005	1.56339	1.56339	.72222	.93249	27.5	32 01 42.03			
0.560	0.52219	0.84726	0.61394	1.62955	1.56387	1.56387	9.72525	9.93401	27.6	32 05 08.29			
.561	.52203	.84672	.61415	1.62905	1.56435	1.56435	.72526	.93404	27.7	32 08 34.56			
.562	.52188	.84619	.61436	1.62855	1.56483	1.56483	.72541	.93407	27.8	32 12 00.82			
.563	.52173	.84566	.61457	1.62805	1.56531	1.56531	.72556	.93410	27.9	32 15 27.09			
.564	.52158	.84512	.61478	1.62755	1.56579	1.56579	.72571	.93413	28.0	32 18 53.35			
0.565	0.52143	0.84459	0.61499	1.62705	1.56627	1.56627	9.72869	9.93566	28.1	32 22 19.62			
.566	.52128	.84405	.61520	1.62655	1.56675	1.56675	.72870	.93569	28.2	32 25 45.88			
.567	.52113	.84352	.61541	1.62605	1.56723	1.56723	.72885	.93572	28.3	32 29 12.15			
.568	.52098	.84298	.61562	1.62555	1.56771	1.56771	.72899	.93575	28.4	32 32 38.41			
.569	.52083	.84244	.61583	1.62505	1.56819	1.56819	.72914	.93578	28.5	32 36 04.67			
0.570	0.52068	0.84190	0.61604	1.62455	1.56867	1.56867	9.73210	9.93726	28.6	32 39 30.94			
.571	.52053	.84136	.61625	1.62405	1.56915	1.56915	.73211	.93729	28.7	32 42 57.20			
.572	.52038	.84082	.61646	1.62355	1.56963	1.56963	.73226	.93732	28.8	32 46 23.47			
.573	.52023	.84028	.61667	1.62305	1.57011	1.57011	.73241	.93735	28.9	32 49 49.73			
.574	.52008	.83974	.61688	1.62255	1.57059	1.57059	.73256	.93738	29.0	32 53 16.00			
0.575	0.51993	0.83920	0.61709	1.62205	1.57107	1.57107	9.73547	9.93886	29.1	32 56 42.26			
.576	.51978	.83866	.61730	1.62155	1.57155	1.57155	.73548	.93889	29.2	32 60 08.53			
.577	.51963	.83812	.61751	1.62105	1.57203	1.57203	.73563	.93892	29.3	32 63 34.79			
.578	.51948	.83758	.61772	1.62055	1.57251	1.57251	.73578	.93895	29.4	32 67 01.06			
.579	.51933	.83704	.61793	1.62005	1.57299	1.57299	.73593	.93898	29.5	32 70 27.32			
0.580	0.51918	0.83650	0.61814	1.61955	1.57347	1.57347	9.73889	9.94045	29.6	32 73 53.59			
.581	.51903	.83596	.61835	1.61905	1.57395	1.57395	.73890	.94048	29.7	32 77 19.85			
.582	.51888	.83542	.61856	1.61855	1.57443	1.57443	.73905	.94051	29.8	32 80 46.12			
.583	.51873	.83488	.61877	1.61805	1.57491	1.57491	.73920	.94054	29.9	32 84 12.38			
.584	.51858	.83434	.61898	1.61755	1.57539	1.57539	.73935	.94057	30.0	32 87 38.65			
0.585	0.51843	0.83380	0.61919	1.61705	1.57587	1.57587	9.74210	9.94202	30.1	32 91 04.91			
.586	.51828	.83326	.61940	1.61655	1.57635	1.57635	.74211	.94205	30.2	32 94 31.18			
.587	.51813	.83272	.61961	1.61605	1.57683	1.57683	.74226	.94208	30.3	32 97 57.44			
.588	.51798	.83218	.61982	1.61555	1.57731	1.57731	.74241	.94211	30.4	33 01 23.71			
.589	.51783	.83164	.62003	1.61505	1.57779	1.57779	.74256	.94214	30.5	33 04 49.97			
0.590	0.51768	0.83110	0.62024	1.61455	1.57827	1.57827	9.74536	9.94357	30.6	33 08 16.24			
.591	.51753	.83056	.62045	1.61405	1.57875	1.57875	.74537	.94360	30.7	33 11 42.50			
.592	.51738	.83002	.62066	1.61355	1.57923	1.57923	.74552	.94363	30.8	33 15 08.77			
.593	.51723	.82948	.62087	1.61305	1.57971	1.57971	.74567	.94366	30.9	33 18 35.03			
.594	.51708	.82894	.62108	1.61255	1.58019	1.58019	.74582	.94369	31.0	33 22 01.30			
0.595	0.51693	0.82840	0.62129	1.61205	1.58067	1.58067	9.74858	9.94511	31.1	33 25 27.56			
.596	.51678	.82786	.62150	1.61155	1.58115	1.58115	.74859	.94514	31.2	33 28 53.82			
.597	.51663	.82732	.62171	1.61105	1.58163	1.58163	.74874	.94517	31.3	33 32 20.09			
.598	.51648	.82678	.62192	1.61055	1.58211	1.58211	.74889	.94520	31.4	33 35 46.35			
.599	.51633	.82624	.62213	1.61005	1.58259	1.58259	.74904	.94523	31.5	33 39 12.62			
0.600	0.51618	0.82570	0.62234	1.60955	1.58307	1.58307	9.75177	9.94663	31.6	33 42 38.88			
u	-1 sin u	-1 cos u	-1 tan u	-1 cot u	-1 sec u	-1 csc u	-1 log sin u	-1 log cos u	-1 log tan u	-1 log cot u	-1 log sec u	-1 log csc u	u

Circular Functions.

α	$\sin \alpha$	$\cos \alpha$	$\tan \alpha$	$\cot \alpha$	$\sec \alpha$	$\csc \alpha$	$\log \sin \alpha$	$\log \cos \alpha$	$\log \tan \alpha$	$\log \cot \alpha$	$\log \sec \alpha$	$\log \csc \alpha$
0.000	0.0000	1.0000	0.0000	∞	1.0000	∞	-1.30103	0.00000	0.00000	0.00000	0.00000	0.00000
0.001	0.0001	0.9999	0.0001	10000	1.0001	10000	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.002	0.0002	0.9998	0.0002	5000	1.0004	5000	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.003	0.0003	0.9997	0.0003	3333	1.0009	3333	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.004	0.0004	0.9996	0.0004	2500	1.0016	2500	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.005	0.0005	0.9995	0.0005	2000	1.0025	2000	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.006	0.0006	0.9994	0.0006	1667	1.0036	1667	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.007	0.0007	0.9993	0.0007	1429	1.0049	1429	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.008	0.0008	0.9992	0.0008	1250	1.0064	1250	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.009	0.0009	0.9991	0.0009	1111	1.0081	1111	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.010	0.0010	0.9990	0.0010	1000	1.0100	1000	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.011	0.0011	0.9989	0.0011	909	1.0121	909	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.012	0.0012	0.9988	0.0012	833	1.0144	833	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.013	0.0013	0.9987	0.0013	769	1.0169	769	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.014	0.0014	0.9986	0.0014	714	1.0196	714	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.015	0.0015	0.9985	0.0015	667	1.0225	667	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.016	0.0016	0.9984	0.0016	625	1.0256	625	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.017	0.0017	0.9983	0.0017	588	1.0289	588	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.018	0.0018	0.9982	0.0018	556	1.0324	556	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.019	0.0019	0.9981	0.0019	529	1.0361	529	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.020	0.0020	0.9980	0.0020	500	1.0400	500	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.021	0.0021	0.9979	0.0021	476	1.0441	476	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.022	0.0022	0.9978	0.0022	455	1.0484	455	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.023	0.0023	0.9977	0.0023	435	1.0529	435	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.024	0.0024	0.9976	0.0024	417	1.0576	417	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.025	0.0025	0.9975	0.0025	400	1.0625	400	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.026	0.0026	0.9974	0.0026	385	1.0676	385	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.027	0.0027	0.9973	0.0027	372	1.0729	372	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.028	0.0028	0.9972	0.0028	361	1.0784	361	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.029	0.0029	0.9971	0.0029	351	1.0841	351	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.030	0.0030	0.9970	0.0030	343	1.0899	343	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.031	0.0031	0.9969	0.0031	336	1.0959	336	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.032	0.0032	0.9968	0.0032	330	1.1020	330	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.033	0.0033	0.9967	0.0033	325	1.1082	325	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.034	0.0034	0.9966	0.0034	321	1.1145	321	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.035	0.0035	0.9965	0.0035	317	1.1209	317	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.036	0.0036	0.9964	0.0036	314	1.1274	314	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.037	0.0037	0.9963	0.0037	311	1.1340	311	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.038	0.0038	0.9962	0.0038	309	1.1407	309	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.039	0.0039	0.9961	0.0039	307	1.1475	307	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.040	0.0040	0.9960	0.0040	306	1.1544	306	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.041	0.0041	0.9959	0.0041	305	1.1614	305	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.042	0.0042	0.9958	0.0042	304	1.1685	304	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.043	0.0043	0.9957	0.0043	303	1.1757	303	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.044	0.0044	0.9956	0.0044	303	1.1830	303	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.045	0.0045	0.9955	0.0045	302	1.1904	302	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.046	0.0046	0.9954	0.0046	302	1.1979	302	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.047	0.0047	0.9953	0.0047	301	1.2055	301	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.048	0.0048	0.9952	0.0048	301	1.2132	301	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.049	0.0049	0.9951	0.0049	300	1.2210	300	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.050	0.0050	0.9950	0.0050	300	1.2289	300	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.051	0.0051	0.9949	0.0051	299	1.2369	299	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.052	0.0052	0.9948	0.0052	299	1.2450	299	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.053	0.0053	0.9947	0.0053	298	1.2532	298	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.054	0.0054	0.9946	0.0054	298	1.2615	298	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.055	0.0055	0.9945	0.0055	297	1.2699	297	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.056	0.0056	0.9944	0.0056	297	1.2784	297	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.057	0.0057	0.9943	0.0057	296	1.2870	296	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.058	0.0058	0.9942	0.0058	296	1.2957	296	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.059	0.0059	0.9941	0.0059	295	1.3045	295	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.060	0.0060	0.9940	0.0060	295	1.3134	295	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.061	0.0061	0.9939	0.0061	294	1.3224	294	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.062	0.0062	0.9938	0.0062	294	1.3315	294	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.063	0.0063	0.9937	0.0063	293	1.3407	293	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.064	0.0064	0.9936	0.0064	293	1.3500	293	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.065	0.0065	0.9935	0.0065	292	1.3594	292	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.066	0.0066	0.9934	0.0066	292	1.3689	292	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.067	0.0067	0.9933	0.0067	291	1.3785	291	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.068	0.0068	0.9932	0.0068	291	1.3882	291	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.069	0.0069	0.9931	0.0069	290	1.3980	290	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.070	0.0070	0.9930	0.0070	290	1.4079	290	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.071	0.0071	0.9929	0.0071	289	1.4179	289	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.072	0.0072	0.9928	0.0072	289	1.4280	289	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.073	0.0073	0.9927	0.0073	288	1.4382	288	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.074	0.0074	0.9926	0.0074	288	1.4485	288	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.075	0.0075	0.9925	0.0075	287	1.4589	287	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.076	0.0076	0.9924	0.0076	287	1.4694	287	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.077	0.0077	0.9923	0.0077	286	1.4800	286	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.078	0.0078	0.9922	0.0078	286	1.4907	286	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.079	0.0079	0.9921	0.0079	285	1.5015	285	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.080	0.0080	0.9920	0.0080	285	1.5124	285	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.081	0.0081	0.9919	0.0081	284	1.5234	284	-1.30103	-0.00000	0.00000	0.00000	0.00000	0.00000
0.082	0.0082	0.9918	0.0082	284	1.5345	284	-					

Circular Functions.

α	$\sin \alpha$	$\approx F'$	$\cos \alpha$	$\approx F'$	$\log \sin \alpha$	$\approx F'$	$\log \cos \alpha$	$\approx F'$	α
0.650	0.60510	29.0	0.79668	60.5	0.78189	57.1	0.00086	33.0	37 14 32.12
0.651	0.60598	29.5	0.79548	60.0	0.78049	57.0	0.00061	33.1	37 17 58.39
0.652	0.60698	29.5	0.79427	60.7	0.78003	56.9	0.00030	33.2	37 21 24.05
0.653	0.60797	29.1	0.79305	60.8	0.78000	56.8	0.00007	33.3	37 24 50.64
0.654	0.60897	29.1	0.79186	60.8	0.78116	56.7	0.00003	33.3	37 28 17.38
0.655	0.60995	29.1	0.79075	60.0	0.78172	56.5	0.00000	33.4	37 31 43.45
0.656	0.60995	29.2	0.78944	61.0	0.78039	56.1	0.00007	33.4	37 35 09.71
0.657	0.61071	29.1	0.78811	61.1	0.78086	56.3	0.00003	33.5	37 38 35.08
0.658	0.61151	29.1	0.78677	61.1	0.78042	56.2	0.00000	33.6	37 42 02.44
0.659	0.61231	29.1	0.78560	61.1	0.78098	56.1	0.00000	33.6	37 45 28.51
0.660	0.61312	29.0	0.78439	61.1	0.78151	56.0	0.00002	33.7	37 49 54.77
0.661	0.61391	28.9	0.78318	61.4	0.78000	55.8	0.00007	33.8	37 53 21.04
0.662	0.61470	28.9	0.78196	61.5	0.78000	55.7	0.00003	33.8	37 56 47.30
0.663	0.61548	28.8	0.78075	61.5	0.78000	55.6	0.00000	33.9	37 59 13.57
0.664	0.61627	28.8	0.77953	61.6	0.78007	55.5	0.00007	34.0	38 02 39.83
0.665	0.61706	28.7	0.77832	61.7	0.78000	55.1	0.00003	34.1	38 06 06.10
0.666	0.61785	28.6	0.77710	61.8	0.78000	55.3	0.00000	34.1	38 09 32.36
0.667	0.61863	28.6	0.77588	61.9	0.78000	55.2	0.00000	34.2	38 12 58.63
0.668	0.61942	28.5	0.77466	61.9	0.78000	55.0	0.00000	34.3	38 16 24.89
0.669	0.62020	28.1	0.77344	62.0	0.78000	54.9	0.00000	34.3	38 19 51.16
0.670	0.62099	28.1	0.77222	62.1	0.78000	54.8	0.00002	34.4	38 23 17.42
0.671	0.62177	28.1	0.77100	62.1	0.78000	54.7	0.00007	34.5	38 26 43.68
0.672	0.62255	28.1	0.76978	62.1	0.78000	54.6	0.00003	34.5	38 29 69.95
0.673	0.62333	28.1	0.76856	62.1	0.78007	54.5	0.00000	34.6	38 32 36.21
0.674	0.62411	28.1	0.76733	62.1	0.78007	54.4	0.00000	34.7	38 35 02.48
0.675	0.62490	28.1	0.76611	62.5	0.78000	54.3	0.00000	34.8	38 38 28.74
0.676	0.62568	28.0	0.76488	62.6	0.78000	54.1	0.00000	34.8	38 41 55.01
0.677	0.62646	27.9	0.76366	62.6	0.78000	54.0	0.00000	34.9	38 45 21.27
0.678	0.62724	27.9	0.76244	62.7	0.78000	53.9	0.00000	35.0	38 48 47.54
0.679	0.62802	27.8	0.76122	62.8	0.78007	53.8	0.00000	35.0	38 51 13.80
0.680	0.62880	27.8	0.75999	62.9	0.78000	53.7	0.00000	35.1	38 54 40.07
0.681	0.62957	27.7	0.75877	63.0	0.78000	53.6	0.00000	35.2	38 58 06.33
0.682	0.63035	27.6	0.75755	63.0	0.78000	53.5	0.00000	35.3	39 01 32.60
0.683	0.63113	27.6	0.75633	63.1	0.78000	53.1	0.00000	35.3	39 04 58.86
0.684	0.63190	27.5	0.75511	63.1	0.78000	53.1	0.00000	35.4	39 08 25.13
0.685	0.63268	27.4	0.75389	63.1	0.78000	53.2	0.00000	35.5	39 11 51.39
0.686	0.63345	27.4	0.75267	63.1	0.78000	53.1	0.00000	35.6	39 15 17.66
0.687	0.63423	27.3	0.75145	63.1	0.78000	53.0	0.00000	35.7	39 18 43.92
0.688	0.63500	27.3	0.75023	63.1	0.78000	52.9	0.00000	35.7	39 22 10.19
0.689	0.63577	27.2	0.74901	63.0	0.78000	52.7	0.00000	35.8	39 25 36.45
0.690	0.63655	27.1	0.74779	62.7	0.78000	52.6	0.00000	35.8	39 29 02.72
0.691	0.63732	27.1	0.74657	62.7	0.78000	52.5	0.00000	35.9	39 32 28.98
0.692	0.63809	27.0	0.74535	62.8	0.78000	52.1	0.00000	36.0	39 35 55.25
0.693	0.63886	27.0	0.74413	62.8	0.78000	52.3	0.00000	36.1	39 39 21.51
0.694	0.63964	26.9	0.74291	62.8	0.78000	52.2	0.00000	36.1	39 42 47.78
0.695	0.64041	26.8	0.74169	62.8	0.78000	52.1	0.00000	36.2	39 46 14.04
0.696	0.64118	26.7	0.74047	62.8	0.78000	52.0	0.00000	36.2	39 49 40.31
0.697	0.64195	26.7	0.73925	62.8	0.78000	51.9	0.00000	36.1	39 53 06.57
0.698	0.64272	26.6	0.73803	62.8	0.78000	51.8	0.00000	36.1	39 56 32.83
0.699	0.64349	26.5	0.73681	62.8	0.78000	51.7	0.00000	36.5	39 59 59.10
0.700	0.64426	26.5	0.73559	62.8	0.78000	51.6	0.00000	36.6	40 03 25.36
α	$-\log \sin \alpha$	$\approx F'$	$\cos \alpha$	$\approx F'$	$\log \sin \alpha$	$\approx F'$	$\log \cos \alpha$	$\approx F'$	α

Circular Functions.

u	$\sin u$	$\cos u$	$\tan u$	$\cot u$	$\sec u$	$\csc u$	$\log \sin u$	$\log \cos u$	$\log \tan u$	u
0.700	0.64422	76.5	0.76484	64.4	9.80503	51.6	9.88357	36.6	40 06 25.36	
.701	.64498	76.4	.76420	64.5	.80555	51.3	.88321	36.7	40 09 51.03	
.702	.64575	76.3	.76355	64.6	.80606	51.4	.88284	36.7	40 13 17.80	
.703	.64651	76.3	.76291	64.7	.80657	51.2	.88247	36.8	40 16 44.16	
.704	.64727	76.2	.76226	64.7	.80709	51.1	.88210	36.9	40 20 10.42	
0.705	0.64803	76.2	0.76161	64.8	9.81160	51.0	9.88173	37.0	40 23 36.69	
.706	.64880	76.1	.76096	64.9	.81211	50.9	.88136	37.0	40 27 02.05	
.707	.64956	76.0	.76031	65.0	.81262	50.8	.88099	37.1	40 30 29.22	
.708	.65032	76.0	.75966	65.0	.81312	50.7	.88062	37.2	40 33 55.48	
.709	.65108	75.9	.75901	65.1	.81363	50.6	.88025	37.3	40 37 21.75	
0.710	0.65183	75.8	0.75836	65.2	9.81414	50.5	9.87988	37.3	40 40 48.01	
.711	.65260	75.8	.75771	65.3	.81464	50.4	.87950	37.4	40 44 14.28	
.712	.65335	75.7	.75706	65.3	.81515	50.3	.87913	37.5	40 47 40.54	
.713	.65411	75.6	.75640	65.4	.81565	50.2	.87875	37.6	40 51 06.81	
.714	.65486	75.6	.75575	65.5	.81615	50.1	.87838	37.6	40 54 33.07	
0.715	0.65562	75.5	0.75509	65.6	9.81665	50.0	9.87800	37.7	40 57 59.34	
.716	.65639	75.4	.75444	65.6	.81715	49.9	.87762	37.8	41 01 25.60	
.717	.65713	75.4	.75378	65.7	.81765	49.8	.87724	37.9	41 04 51.87	
.718	.65788	75.3	.75312	65.8	.81815	49.7	.87687	37.9	41 08 18.13	
.719	.65863	75.2	.75246	65.9	.81864	49.6	.87649	38.0	41 11 44.40	
0.720	0.65938	75.2	0.75181	65.9	9.81914	49.5	9.87611	38.1	41 15 10.66	
.721	.66014	75.1	.75115	66.0	.81963	49.4	.87572	38.2	41 18 36.93	
.722	.66089	75.0	.75049	66.1	.82013	49.3	.87534	38.2	41 22 03.19	
.723	.66164	75.0	.74982	66.2	.82062	49.2	.87496	38.3	41 25 29.45	
.724	.66239	74.9	.74916	66.2	.82111	49.1	.87458	38.4	41 28 55.72	
0.725	0.66314	74.8	0.74850	66.3	9.82160	49.0	9.87419	38.5	41 32 21.98	
.726	.66388	74.8	.74784	66.4	.82209	48.9	.87381	38.6	41 35 48.25	
.727	.66463	74.7	.74717	66.5	.82258	48.8	.87343	38.6	41 39 14.51	
.728	.66538	74.7	.74651	66.5	.82307	48.7	.87305	38.7	41 42 40.78	
.729	.66612	74.6	.74584	66.6	.82356	48.6	.87267	38.8	41 46 07.04	
0.730	0.66687	74.5	0.74517	66.7	9.82404	48.5	9.87228	38.9	41 49 33.31	
.731	.66761	74.5	.74451	66.8	.82453	48.4	.87187	38.9	41 52 59.57	
.732	.66836	74.4	.74384	66.8	.82501	48.3	.87148	39.0	41 56 25.84	
.733	.66910	74.3	.74317	66.9	.82549	48.2	.87109	39.1	41 59 52.10	
.734	.66984	74.3	.74250	67.0	.82597	48.1	.87070	39.2	42 03 18.37	
0.735	0.67059	74.2	0.74183	67.1	9.82646	48.0	9.87030	39.3	42 06 44.63	
.736	.67133	74.1	.74116	67.1	.82694	47.9	.86991	39.3	42 10 10.90	
.737	.67207	74.0	.74049	67.2	.82741	47.8	.86952	39.4	42 13 37.16	
.738	.67281	74.0	.73982	67.3	.82789	47.8	.86912	39.5	42 17 03.43	
.739	.67355	73.9	.73914	67.4	.82837	47.7	.86873	39.6	42 20 29.69	
0.740	0.67430	73.8	0.73847	67.4	9.82885	47.6	9.86833	39.7	42 23 55.96	
.741	.67503	73.8	.73779	67.5	.82932	47.5	.86794	39.7	42 27 22.22	
.742	.67576	73.7	.73712	67.6	.82979	47.4	.86754	39.8	42 30 48.48	
.743	.67650	73.6	.73644	67.7	.83027	47.3	.86714	39.9	42 34 14.75	
.744	.67724	73.6	.73577	67.7	.83074	47.2	.86674	40.0	42 37 41.02	
0.745	0.67797	73.5	0.73509	67.8	9.83121	47.1	9.86634	40.0	42 41 07.28	
.746	.67871	73.4	.73441	67.9	.83168	47.0	.86594	40.1	42 44 33.55	
.747	.67944	73.4	.73373	67.9	.83215	46.9	.86554	40.2	42 47 59.81	
.748	.68017	73.3	.73305	68.0	.83262	46.8	.86513	40.3	42 51 26.08	
.749	.68091	73.3	.73237	68.1	.83309	46.7	.86473	40.4	42 54 52.34	
0.750	0.68164	73.2	0.73169	68.2	9.83355	46.6	9.86433	40.5	42 58 18.60	
u	$-\sin u$	$\cos u$	$\tan u$	$\cot u$	$\sec u$	$\csc u$	$\log \sin u$	$\log \cos u$	$\log \tan u$	u

Circular Functions.

α	$\sin \alpha$	$\cos \alpha$	$\tan \alpha$	$\cot \alpha$	$\sec \alpha$	$\csc \alpha$	$\log \sin \alpha$	$\log \cos \alpha$	$\log \tan \alpha$	α
0.790	0.708163	0.708163	0.708163	0.708163	0.708163	0.708163	0.85133	0.85133	0.85133	42 58' 18.76
.791	0.708347	0.708347	0.708347	0.708347	0.708347	0.708347	0.85133	0.85133	0.85133	43 01 44.87
.792	0.708531	0.708531	0.708531	0.708531	0.708531	0.708531	0.85133	0.85133	0.85133	43 05 11.13
.793	0.708715	0.708715	0.708715	0.708715	0.708715	0.708715	0.85133	0.85133	0.85133	43 08 37.40
.794	0.708899	0.708899	0.708899	0.708899	0.708899	0.708899	0.85133	0.85133	0.85133	43 12 03.66
0.795	0.709083	0.709083	0.709083	0.709083	0.709083	0.709083	0.85133	0.85133	0.85133	43 15 29.93
.796	0.709267	0.709267	0.709267	0.709267	0.709267	0.709267	0.85133	0.85133	0.85133	43 18 56.20
.797	0.709451	0.709451	0.709451	0.709451	0.709451	0.709451	0.85133	0.85133	0.85133	43 22 22.46
.798	0.709635	0.709635	0.709635	0.709635	0.709635	0.709635	0.85133	0.85133	0.85133	43 25 48.72
.799	0.709819	0.709819	0.709819	0.709819	0.709819	0.709819	0.85133	0.85133	0.85133	43 29 14.99
0.799	0.709999	0.709999	0.709999	0.709999	0.709999	0.709999	0.85133	0.85133	0.85133	43 32 41.25
.800	0.710179	0.710179	0.710179	0.710179	0.710179	0.710179	0.85133	0.85133	0.85133	43 36 07.52
.801	0.710359	0.710359	0.710359	0.710359	0.710359	0.710359	0.85133	0.85133	0.85133	43 39 33.78
.802	0.710539	0.710539	0.710539	0.710539	0.710539	0.710539	0.85133	0.85133	0.85133	43 43 00.05
.803	0.710719	0.710719	0.710719	0.710719	0.710719	0.710719	0.85133	0.85133	0.85133	43 46 26.31
0.804	0.710899	0.710899	0.710899	0.710899	0.710899	0.710899	0.85133	0.85133	0.85133	43 49 52.58
.805	0.711079	0.711079	0.711079	0.711079	0.711079	0.711079	0.85133	0.85133	0.85133	43 53 18.84
.806	0.711259	0.711259	0.711259	0.711259	0.711259	0.711259	0.85133	0.85133	0.85133	43 56 45.11
.807	0.711439	0.711439	0.711439	0.711439	0.711439	0.711439	0.85133	0.85133	0.85133	43 60 11.37
.808	0.711619	0.711619	0.711619	0.711619	0.711619	0.711619	0.85133	0.85133	0.85133	43 63 37.64
0.809	0.711799	0.711799	0.711799	0.711799	0.711799	0.711799	0.85133	0.85133	0.85133	43 67 03.90
.810	0.711979	0.711979	0.711979	0.711979	0.711979	0.711979	0.85133	0.85133	0.85133	43 70 30.17
.811	0.712159	0.712159	0.712159	0.712159	0.712159	0.712159	0.85133	0.85133	0.85133	43 73 56.43
.812	0.712339	0.712339	0.712339	0.712339	0.712339	0.712339	0.85133	0.85133	0.85133	43 77 22.70
.813	0.712519	0.712519	0.712519	0.712519	0.712519	0.712519	0.85133	0.85133	0.85133	43 80 48.96
0.814	0.712699	0.712699	0.712699	0.712699	0.712699	0.712699	0.85133	0.85133	0.85133	43 84 15.22
.815	0.712879	0.712879	0.712879	0.712879	0.712879	0.712879	0.85133	0.85133	0.85133	43 87 41.49
.816	0.713059	0.713059	0.713059	0.713059	0.713059	0.713059	0.85133	0.85133	0.85133	43 91 07.75
.817	0.713239	0.713239	0.713239	0.713239	0.713239	0.713239	0.85133	0.85133	0.85133	43 94 34.02
.818	0.713419	0.713419	0.713419	0.713419	0.713419	0.713419	0.85133	0.85133	0.85133	43 98 00.28
0.819	0.713599	0.713599	0.713599	0.713599	0.713599	0.713599	0.85133	0.85133	0.85133	44 01 26.55
.820	0.713779	0.713779	0.713779	0.713779	0.713779	0.713779	0.85133	0.85133	0.85133	44 04 52.81
.821	0.713959	0.713959	0.713959	0.713959	0.713959	0.713959	0.85133	0.85133	0.85133	44 08 19.08
.822	0.714139	0.714139	0.714139	0.714139	0.714139	0.714139	0.85133	0.85133	0.85133	44 11 45.34
.823	0.714319	0.714319	0.714319	0.714319	0.714319	0.714319	0.85133	0.85133	0.85133	44 15 11.61
0.824	0.714499	0.714499	0.714499	0.714499	0.714499	0.714499	0.85133	0.85133	0.85133	44 18 37.87
.825	0.714679	0.714679	0.714679	0.714679	0.714679	0.714679	0.85133	0.85133	0.85133	44 22 04.14
.826	0.714859	0.714859	0.714859	0.714859	0.714859	0.714859	0.85133	0.85133	0.85133	44 25 30.40
.827	0.715039	0.715039	0.715039	0.715039	0.715039	0.715039	0.85133	0.85133	0.85133	44 28 56.67
.828	0.715219	0.715219	0.715219	0.715219	0.715219	0.715219	0.85133	0.85133	0.85133	44 32 22.93
0.829	0.715399	0.715399	0.715399	0.715399	0.715399	0.715399	0.85133	0.85133	0.85133	44 35 49.20
.830	0.715579	0.715579	0.715579	0.715579	0.715579	0.715579	0.85133	0.85133	0.85133	44 39 15.46
.831	0.715759	0.715759	0.715759	0.715759	0.715759	0.715759	0.85133	0.85133	0.85133	44 42 41.73
.832	0.715939	0.715939	0.715939	0.715939	0.715939	0.715939	0.85133	0.85133	0.85133	44 46 07.99
.833	0.716119	0.716119	0.716119	0.716119	0.716119	0.716119	0.85133	0.85133	0.85133	44 49 34.26
0.834	0.716299	0.716299	0.716299	0.716299	0.716299	0.716299	0.85133	0.85133	0.85133	44 53 00.52
.835	0.716479	0.716479	0.716479	0.716479	0.716479	0.716479	0.85133	0.85133	0.85133	44 56 26.79
.836	0.716659	0.716659	0.716659	0.716659	0.716659	0.716659	0.85133	0.85133	0.85133	44 59 53.05
.837	0.716839	0.716839	0.716839	0.716839	0.716839	0.716839	0.85133	0.85133	0.85133	45 03 19.32
.838	0.717019	0.717019	0.717019	0.717019	0.717019	0.717019	0.85133	0.85133	0.85133	45 06 45.58
0.839	0.717199	0.717199	0.717199	0.717199	0.717199	0.717199	0.85133	0.85133	0.85133	45 10 11.84
.840	0.717379	0.717379	0.717379	0.717379	0.717379	0.717379	0.85133	0.85133	0.85133	45 13 38.11
.841	0.717559	0.717559	0.717559	0.717559	0.717559	0.717559	0.85133	0.85133	0.85133	45 17 04.37
.842	0.717739	0.717739	0.717739	0.717739	0.717739	0.717739	0.85133	0.85133	0.85133	45 20 30.64
.843	0.717919	0.717919	0.717919	0.717919	0.717919	0.717919	0.85133	0.85133	0.85133	45 23 56.90
.844	0.718099	0.718099	0.718099	0.718099	0.718099	0.718099	0.85133	0.85133	0.85133	45 27 23.17
.845	0.718279	0.718279	0.718279	0.718279	0.718279	0.718279	0.85133	0.85133	0.85133	45 30 49.43
.846	0.718459	0.718459	0.718459	0.718459	0.718459	0.718459	0.85133	0.85133	0.85133	45 34 15.70
.847	0.718639	0.718639	0.718639	0.718639	0.718639	0.718639	0.85133	0.85133	0.85133	45 37 41.96
.848	0.718819	0.718819	0.718819	0.718819	0.718819	0.718819	0.85133	0.85133	0.85133	45 41 08.23
.849	0.718999	0.718999	0.718999	0.718999	0.718999	0.718999	0.85133	0.85133	0.85133	45 44 34.49
0.850	0.719179	0.719179	0.719179	0.719179	0.719179	0.719179	0.85133	0.85133	0.85133	45 48 00.76
.851	0.719359	0.719359	0.719359	0.719359	0.719359	0.719359	0.85133	0.85133	0.85133	45 51 27.02
.852	0.719539	0.719539	0.719539	0.719539	0.719539	0.719539	0.85133	0.85133	0.85133	45 54 53.28
.853	0.719719	0.719719	0.719719	0.719719	0.719719	0.719719	0.85133	0.85133	0.85133	45 58 19.54
.854	0.719899	0.719899	0.719899	0.719899	0.719899	0.719899	0.85133	0.85133	0.85133	46 01 45.81
.855	0.720079	0.720079	0.720079	0.720079	0.720079	0.720079	0.85133	0.85133	0.85133	46 05 12.07
.856	0.720259	0.720259	0.720259	0.720259	0.720259	0.720259	0.85133	0.85133	0.85133	46 08 38.34
.857	0.720439	0.720439	0.720439	0.720439	0.720439	0.720439	0.85133	0.85133	0.85133	46 12 04.60
.858	0.720619	0.720619	0.720619	0.720619	0.720619	0.720619	0.85133	0.85133	0.85133	46 15 30.87
.859	0.720799	0.720799	0.720799	0.720799	0.720799	0.720799	0.85133	0.85133	0.85133	46 18 57.13
.860	0.720979	0.720979	0.720979	0.720979	0.720979	0.720979	0.85133	0.85133	0.85133	46 22 23.40
.861	0.721159	0.721159	0.721159	0.721159	0.721159	0.721159	0.85133	0.85133	0.85133	46 25 49.66
.862	0.721339	0.721339	0.721339	0.721339	0.721339	0.721339	0.85133	0.85133	0.85133	46 29 15.93
.863	0.721519	0.721519	0.721519	0.721519	0.721519	0.721519	0.85133	0.85133	0.85133	46 32 42.19
.864	0.721699	0.721699	0.721699	0.721699	0.721699	0.721699	0.85133	0.85133	0.85133	46 36 08.46
.865	0.721879	0.721879	0.721879	0.721879	0.721879	0.721879	0.85133	0.85133	0.85133	46 39 34.72
.866	0.722059	0.722059	0.722059	0.722059	0.722059	0.722059	0.85133	0.85133	0.85133	46 43 00.99
.867	0.722239	0.722239	0.722239	0.722239	0.722239	0.722239	0.85133	0.85133	0.85133	46 46 27.25
.868	0.722419	0.722419	0.722419	0.722419	0.722419	0.722419	0.85133	0.85133	0.85133	46 49 53.52
.869	0.722599	0.722599	0.722599	0.722599	0.722599	0.722599	0.85133	0.85133	0.85133	46 53 19.78
.870	0.722779	0.722779	0.722779	0.722779	0.722779	0.722779	0.85133	0.85133	0.85133	46 56 46.05
.871	0.722959	0.722959	0.722959	0.722959	0.722959	0.722959	0.85133	0.85133	0.85133	46 60 12.31
.872	0.723139	0.723139	0.723139	0.723139	0.723139	0.723139	0.85133	0.85133	0.85133	46 63 38.58
.873	0.723319	0.723319	0.723319	0.723319</						

Circular Functions.

u	$\sin u$	$\cos u$	$\tan u$	$\cot u$	$\sec u$	$\csc u$	$\log \sin u$	$\log \cos u$	$\log \tan u$	$\log \cot u$	$\log \sec u$	$\log \csc u$
0.800	0.71735	0.697	0.697	1.420	1.420	1.420	9.85373	9.85373	0.00000	0.00000	0.00000	0.00000
.801	.71805	.696	.696	1.421	1.421	1.421	9.85400	9.85400	0.00000	0.00000	0.00000	0.00000
.802	.71875	.695	.695	1.422	1.422	1.422	9.85427	9.85427	0.00000	0.00000	0.00000	0.00000
.803	.71944	.694	.694	1.423	1.423	1.423	9.85454	9.85454	0.00000	0.00000	0.00000	0.00000
.804	.72014	.693	.693	1.424	1.424	1.424	9.85481	9.85481	0.00000	0.00000	0.00000	0.00000
0.805	0.72083	0.692	0.692	1.425	1.425	1.425	9.85508	9.85508	0.00000	0.00000	0.00000	0.00000
.806	.72152	.691	.691	1.426	1.426	1.426	9.85535	9.85535	0.00000	0.00000	0.00000	0.00000
.807	.72222	.690	.690	1.427	1.427	1.427	9.85562	9.85562	0.00000	0.00000	0.00000	0.00000
.808	.72291	.689	.689	1.428	1.428	1.428	9.85589	9.85589	0.00000	0.00000	0.00000	0.00000
.809	.72360	.688	.688	1.429	1.429	1.429	9.85616	9.85616	0.00000	0.00000	0.00000	0.00000
0.810	0.72429	0.687	0.687	1.430	1.430	1.430	9.85643	9.85643	0.00000	0.00000	0.00000	0.00000
.811	.72498	.686	.686	1.431	1.431	1.431	9.85670	9.85670	0.00000	0.00000	0.00000	0.00000
.812	.72567	.685	.685	1.432	1.432	1.432	9.85697	9.85697	0.00000	0.00000	0.00000	0.00000
.813	.72636	.684	.684	1.433	1.433	1.433	9.85724	9.85724	0.00000	0.00000	0.00000	0.00000
.814	.72704	.683	.683	1.434	1.434	1.434	9.85751	9.85751	0.00000	0.00000	0.00000	0.00000
0.815	0.72773	0.682	0.682	1.435	1.435	1.435	9.85778	9.85778	0.00000	0.00000	0.00000	0.00000
.816	.72842	.681	.681	1.436	1.436	1.436	9.85805	9.85805	0.00000	0.00000	0.00000	0.00000
.817	.72911	.680	.680	1.437	1.437	1.437	9.85832	9.85832	0.00000	0.00000	0.00000	0.00000
.818	.72979	.679	.679	1.438	1.438	1.438	9.85859	9.85859	0.00000	0.00000	0.00000	0.00000
.819	.73048	.678	.678	1.439	1.439	1.439	9.85886	9.85886	0.00000	0.00000	0.00000	0.00000
0.820	0.73117	0.677	0.677	1.440	1.440	1.440	9.85913	9.85913	0.00000	0.00000	0.00000	0.00000
.821	.73186	.676	.676	1.441	1.441	1.441	9.85940	9.85940	0.00000	0.00000	0.00000	0.00000
.822	.73254	.675	.675	1.442	1.442	1.442	9.85967	9.85967	0.00000	0.00000	0.00000	0.00000
.823	.73323	.674	.674	1.443	1.443	1.443	9.85994	9.85994	0.00000	0.00000	0.00000	0.00000
.824	.73391	.673	.673	1.444	1.444	1.444	9.86021	9.86021	0.00000	0.00000	0.00000	0.00000
0.825	0.73460	0.672	0.672	1.445	1.445	1.445	9.86048	9.86048	0.00000	0.00000	0.00000	0.00000
.826	.73528	.671	.671	1.446	1.446	1.446	9.86075	9.86075	0.00000	0.00000	0.00000	0.00000
.827	.73597	.670	.670	1.447	1.447	1.447	9.86102	9.86102	0.00000	0.00000	0.00000	0.00000
.828	.73665	.669	.669	1.448	1.448	1.448	9.86129	9.86129	0.00000	0.00000	0.00000	0.00000
.829	.73734	.668	.668	1.449	1.449	1.449	9.86156	9.86156	0.00000	0.00000	0.00000	0.00000
0.830	0.73802	0.667	0.667	1.450	1.450	1.450	9.86183	9.86183	0.00000	0.00000	0.00000	0.00000
.831	.73871	.666	.666	1.451	1.451	1.451	9.86210	9.86210	0.00000	0.00000	0.00000	0.00000
.832	.73939	.665	.665	1.452	1.452	1.452	9.86237	9.86237	0.00000	0.00000	0.00000	0.00000
.833	.74008	.664	.664	1.453	1.453	1.453	9.86264	9.86264	0.00000	0.00000	0.00000	0.00000
.834	.74076	.663	.663	1.454	1.454	1.454	9.86291	9.86291	0.00000	0.00000	0.00000	0.00000
0.835	0.74145	0.662	0.662	1.455	1.455	1.455	9.86318	9.86318	0.00000	0.00000	0.00000	0.00000
.836	.74213	.661	.661	1.456	1.456	1.456	9.86345	9.86345	0.00000	0.00000	0.00000	0.00000
.837	.74282	.660	.660	1.457	1.457	1.457	9.86372	9.86372	0.00000	0.00000	0.00000	0.00000
.838	.74350	.659	.659	1.458	1.458	1.458	9.86399	9.86399	0.00000	0.00000	0.00000	0.00000
.839	.74419	.658	.658	1.459	1.459	1.459	9.86426	9.86426	0.00000	0.00000	0.00000	0.00000
0.840	0.74487	0.657	0.657	1.460	1.460	1.460	9.86453	9.86453	0.00000	0.00000	0.00000	0.00000
.841	.74556	.656	.656	1.461	1.461	1.461	9.86480	9.86480	0.00000	0.00000	0.00000	0.00000
.842	.74624	.655	.655	1.462	1.462	1.462	9.86507	9.86507	0.00000	0.00000	0.00000	0.00000
.843	.74693	.654	.654	1.463	1.463	1.463	9.86534	9.86534	0.00000	0.00000	0.00000	0.00000
.844	.74761	.653	.653	1.464	1.464	1.464	9.86561	9.86561	0.00000	0.00000	0.00000	0.00000
0.845	0.74830	0.652	0.652	1.465	1.465	1.465	9.86588	9.86588	0.00000	0.00000	0.00000	0.00000
.846	.74898	.651	.651	1.466	1.466	1.466	9.86615	9.86615	0.00000	0.00000	0.00000	0.00000
.847	.74967	.650	.650	1.467	1.467	1.467	9.86642	9.86642	0.00000	0.00000	0.00000	0.00000
.848	.75035	.649	.649	1.468	1.468	1.468	9.86669	9.86669	0.00000	0.00000	0.00000	0.00000
.849	.75104	.648	.648	1.469	1.469	1.469	9.86696	9.86696	0.00000	0.00000	0.00000	0.00000
0.850	0.75172	0.647	0.647	1.470	1.470	1.470	9.86723	9.86723	0.00000	0.00000	0.00000	0.00000
.851	.75241	.646	.646	1.471	1.471	1.471	9.86750	9.86750	0.00000	0.00000	0.00000	0.00000
.852	.75309	.645	.645	1.472	1.472	1.472	9.86777	9.86777	0.00000	0.00000	0.00000	0.00000
.853	.75378	.644	.644	1.473	1.473	1.473	9.86804	9.86804	0.00000	0.00000	0.00000	0.00000
.854	.75446	.643	.643	1.474	1.474	1.474	9.86831	9.86831	0.00000	0.00000	0.00000	0.00000
0.855	0.75515	0.642	0.642	1.475	1.475	1.475	9.86858	9.86858	0.00000	0.00000	0.00000	0.00000
.856	.75583	.641	.641	1.476	1.476	1.476	9.86885	9.86885	0.00000	0.00000	0.00000	0.00000
.857	.75652	.640	.640	1.477	1.477	1.477	9.86912	9.86912	0.00000	0.00000	0.00000	0.00000
.858	.75720	.639	.639	1.478	1.478	1.478	9.86939	9.86939	0.00000	0.00000	0.00000	0.00000
.859	.75789	.638	.638	1.479	1.479	1.479	9.86966	9.86966	0.00000	0.00000	0.00000	0.00000
0.860	0.75857	0.637	0.637	1.480	1.480	1.480	9.86993	9.86993	0.00000	0.00000	0.00000	0.00000
.861	.75926	.636	.636	1.481	1.481	1.481	9.87020	9.87020	0.00000	0.00000	0.00000	0.00000
.862	.75994	.635	.635	1.482	1.482	1.482	9.87047	9.87047	0.00000	0.00000	0.00000	0.00000
.863	.76063	.634	.634	1.483	1.483	1.483	9.87074	9.87074	0.00000	0.00000	0.00000	0.00000
.864	.76131	.633	.633	1.484	1.484	1.484	9.87101	9.87101	0.00000	0.00000	0.00000	0.00000
0.865	0.76200	0.632	0.632	1.485	1.485	1.485	9.87128	9.87128	0.00000	0.00000	0.00000	0.00000
.866	.76268	.631	.631	1.486	1.486	1.486	9.87155	9.87155	0.00000	0.00000	0.00000	0.00000
.867	.76337	.630	.630	1.487	1.487	1.487	9.87182	9.87182	0.00000	0.00000	0.00000	0.00000
.868	.76405	.629	.629	1.488	1.488	1.488	9.87209	9.87209	0.00000	0.00000	0.00000	0.00000
.869	.76474	.628	.628	1.489	1.489	1.489	9.87236	9.87236	0.00000	0.00000	0.00000	0.00000
0.870	0.76542	0.627	0.627	1.490	1.490	1.490	9.87263	9.87263	0.00000	0.00000	0.00000	0.00000
.871	.76611	.626	.626	1.491	1.491	1.491	9.87290	9.87290	0.00000	0.00000	0.00000	0.00000
.872	.76679	.625	.625	1.492	1.492	1.492	9.87317	9.87317	0.00000	0.00000	0.00000	0.00000
.873	.76748	.624	.624	1.493	1.493	1.493	9.87344	9.87344	0.00000	0.00000	0.00000	0.00000
.874	.76816	.623	.623	1.494	1.494	1.494	9.87371	9.87371	0.00000	0.00000	0.00000	0.00000
.875	.76885	.622	.622	1.495	1.495	1.495	9.87398	9.87398	0.00000	0.00000	0.00000	0.00000
0.876	0.76953	0.621	0.621	1.496	1.496	1.496	9.87425	9.87425	0.00000	0.00000	0.00000	0.00000
.877	.77022	.620	.620	1.497	1.497	1.497	9.87452	9.87452	0.00000	0.00000	0.00000	0.00000
.878	.77090	.619	.619	1.498	1.498	1.498	9.87479	9.87479	0.00000	0.00000	0.00000	0.00000
.879	.77159	.618	.618	1.499	1.499	1.499	9.87506	9.87506	0.00000	0.00000	0.00000	0.00000
0.880	0.77227	0.617	0.617	1.500	1.500	1.500	9.87533	9.87533	0.00000	0.00000	0.00000	0.00000
.881	.77296	.616	.616	1.501	1.501	1.501	9.87560	9.87560	0.00000	0.00000	0.00000	0.00000
.882	.77364	.615	.615	1.502	1.502	1.502	9.87587	9.87587	0.00000	0.00000	0.00000	0.00000
.883	.77433	.614	.614	1.503	1.503	1.503	9.87614	9.87614	0.00000	0.00000	0.00000	0.00000
.884	.77501	.613	.613	1.504	1.504	1.504	9.87641	9.87641	0.0			

Circular Functions.

u	$\sin u$	$= F'$	$\cos u$	$= F'$	$\log \sin u$	$= F'$	$\log \cos u$	$= F'$	u
0.890	0.78128	65.0	0.62008	75.1	9.87580	38.2	9.81053	40.4	48° 42' 05.09
.891	.78194	65.0	.61923	75.2	.87618	38.1	.81064	40.5	48 43 31.35
.892	.78260	65.0	.61838	75.3	.87656	38.0	.81074	40.6	48 44 57.61
.893	.78326	65.0	.61753	75.3	.87694	37.9	.81085	40.7	48 46 23.88
.894	.78391	65.0	.61667	75.4	.87732	37.8	.81095	40.8	48 47 50.14
0.895	0.78457	65.0	0.61582	75.5	9.87770	37.8	9.81105	40.9	48 49 16.41
.896	.78523	65.5	.61496	75.5	.87808	37.7	.81115	41.0	49 02 42.67
.897	.78588	65.5	.61411	75.6	.87845	37.6	.81125	41.1	49 06 08.94
.898	.78654	65.4	.61325	75.7	.87883	37.5	.81135	41.2	49 09 35.20
.899	.78719	65.3	.61239	75.7	.87920	37.5	.81144	41.3	49 13 01.47
0.890	0.78784	65.2	0.61154	75.8	9.87958	37.4	9.81154	41.4	49 16 27.73
.891	.78849	65.2	.61068	75.8	.87995	37.3	.81163	41.5	49 19 54.00
.892	.78915	65.1	.60982	75.9	.88033	37.2	.81173	41.6	49 23 20.26
.893	.78980	65.0	.60896	76.0	.88070	37.2	.81182	41.7	49 26 46.53
.894	.79045	64.9	.60810	76.0	.88107	37.1	.81191	41.8	49 30 12.79
0.895	0.79110	64.8	0.60724	76.1	9.88144	37.0	9.81200	41.9	49 33 39.06
.896	.79174	64.8	.60638	76.2	.88181	36.9	.81209	42.0	49 37 05.32
.897	.79239	64.7	.60552	76.2	.88218	36.9	.81218	42.1	49 40 31.59
.898	.79304	64.6	.60466	76.3	.88255	36.8	.81227	42.2	49 43 57.85
.899	.79368	64.6	.60380	76.4	.88291	36.7	.81236	42.3	49 47 24.12
0.890	0.79433	64.5	0.60294	76.4	9.88328	36.6	9.81244	42.4	49 50 50.38
.891	.79497	64.4	.60208	76.5	.88365	36.6	.81253	42.5	49 54 16.65
.892	.79562	64.3	.60122	76.6	.88401	36.5	.81262	42.6	49 57 42.91
.893	.79626	64.3	.60036	76.6	.88438	36.4	.81271	42.7	50 01 09.18
.894	.79690	64.2	.60050	76.7	.88474	36.3	.81280	42.8	50 04 35.44
0.895	0.79754	64.1	0.60064	76.8	9.88510	36.3	9.81288	42.9	50 08 01.71
.896	.79818	64.0	.60078	76.8	.88547	36.2	.81297	43.0	50 11 27.97
.897	.79882	63.9	.60092	76.9	.88583	36.1	.81306	43.1	50 14 54.24
.898	.79946	63.9	.60106	76.9	.88619	36.0	.81315	43.2	50 18 20.50
.899	.79910	63.8	.60120	77.0	.88655	35.9	.81324	43.3	50 21 46.76
0.890	0.79974	63.7	0.60134	77.1	9.88691	35.9	9.81332	43.4	50 25 13.03
.891	.79938	63.6	.60148	77.1	.88727	35.8	.81341	43.5	50 28 39.29
.892	.79902	63.6	.60162	77.2	.88762	35.8	.81350	43.6	50 32 05.56
.893	.79966	63.5	.60176	77.3	.88798	35.7	.81359	43.7	50 35 31.82
.894	.79930	63.4	.60190	77.3	.88834	35.6	.81368	43.8	50 38 58.09
0.895	0.79994	63.3	0.60204	77.4	9.88869	35.5	9.81376	43.9	50 42 24.35
.896	.79958	63.3	.60218	77.5	.88905	35.5	.81385	44.0	50 45 50.62
.897	.79922	63.2	.60232	77.5	.88940	35.4	.81394	44.1	50 49 16.88
.898	.79986	63.1	.60246	77.6	.88976	35.3	.81403	44.2	50 52 43.15
.899	.79950	63.0	.60260	77.6	.89011	35.2	.81412	44.3	50 56 09.41
0.890	0.79977	62.9	0.60274	77.7	9.89046	35.2	9.81420	44.4	50 59 35.68
.891	.79941	62.9	.60288	77.8	.89081	35.1	.81429	44.5	51 03 01.94
.892	.79905	62.8	.60302	77.8	.89116	35.0	.81438	44.6	51 06 28.21
.893	.79969	62.7	.60316	77.9	.89151	35.0	.81447	44.7	51 09 54.47
.894	.79933	62.6	.60330	78.0	.89185	34.9	.81456	44.8	51 13 20.74
0.895	0.79997	62.5	0.60344	78.0	9.89221	34.8	9.81464	44.9	51 16 47.00
.896	.79961	62.5	.60358	78.1	.89256	34.7	.81473	45.0	51 20 13.27
.897	.79925	62.4	.60372	78.1	.89291	34.7	.81482	45.1	51 23 39.53
.898	.79989	62.3	.60386	78.2	.89325	34.6	.81491	45.2	51 27 05.80
.899	.79953	62.2	.60400	78.3	.89360	34.5	.81500	45.3	51 30 32.06
0.900	0.79917	62.2	0.60414	78.3	9.89394	34.5	9.81508	45.4	51 33 58.33
u	$-\sin u$	$= F'$	$\cosh u$	$= F'$	$\log \frac{\sinh u}{u}$	$= F'$	$\log \cosh u$	$= F'$	u

Circular Functions.

u	$\sin u$	$\sin' u$	$\cos u$	$\cos' u$	$\log \sin u$	$\log \sin' u$	$\log \cos u$	$\log \cos' u$	u
0.000	0.78533	62.2	0.62161	78.3	9.80304	34.5	9.70352	54.7	51 33 58.33
.001	.78535	62.1	.62163	78.4	.80420	34.4	.70407	54.8	51 37 54.50
.002	.78537	62.0	.62165	78.5	.80533	34.3	.70492	55.0	51 40 50.86
.003	.78539	61.9	.62166	78.5	.80647	34.2	.70587	55.1	51 44 17.12
.004	.78541	61.8	.62167	78.6	.80759	34.2	.70682	55.2	51 47 43.28
0.005	0.78543	61.8	0.62169	78.6	0.80866	34.1	0.70777	55.3	51 51 00.65
.006	.78544	61.7	.62170	78.7	.80970	34.0	.70871	55.4	51 54 35.04
.007	.78546	61.6	.62171	78.8	.81073	34.0	.70965	55.5	51 58 02.18
.008	.78547	61.5	.62172	78.8	.81176	33.9	.71059	55.6	52 01 28.44
.009	.78549	61.5	.62173	78.9	.81278	33.8	.71152	55.8	52 04 54.71
0.010	0.78550	61.4	0.62175	79.0	0.81379	33.8	0.71245	55.9	52 08 20.07
.011	.78551	61.3	.62176	79.0	.81479	33.7	.71337	56.0	52 11 47.24
.012	.78552	61.2	.62177	79.1	.81578	33.6	.71428	56.1	52 15 13.50
.013	.78553	61.1	.62178	79.1	.81676	33.6	.71518	56.2	52 18 39.77
.014	.78554	61.1	.62179	79.2	.81773	33.5	.71607	56.3	52 22 06.03
0.015	0.78555	61.0	0.62180	79.3	0.81869	33.4	0.71695	56.4	52 25 32.30
.016	.78556	60.9	.62181	79.3	.81964	33.3	.71782	56.5	52 28 58.56
.017	.78557	60.8	.62182	79.4	.82058	33.3	.71868	56.7	52 32 24.83
.018	.78558	60.7	.62183	79.4	.82151	33.2	.71953	56.8	52 35 51.09
.019	.78559	60.7	.62184	79.5	.82243	33.1	.72037	56.9	52 39 17.36
0.020	0.78560	60.6	0.62185	79.6	0.82334	33.1	0.72120	57.0	52 42 43.62
.021	.78561	60.5	.62186	79.6	.82424	33.0	.72202	57.2	52 46 09.89
.022	.78562	60.4	.62187	79.7	.82513	32.9	.72283	57.3	52 49 36.15
.023	.78563	60.3	.62188	79.7	.82601	32.8	.72363	57.4	52 53 02.42
.024	.78564	60.3	.62189	79.8	.82688	32.8	.72442	57.5	52 56 28.68
0.025	0.78565	60.2	0.62190	79.9	0.82774	32.7	0.72520	57.6	52 59 54.95
.026	.78566	60.1	.62191	79.9	.82859	32.7	.72600	57.7	53 03 21.21
.027	.78567	60.0	.62192	80.0	.82943	32.6	.72678	57.9	53 06 47.48
.028	.80012	59.9	.60444	80.0	.90312	32.5	.77774	58.0	53 10 13.74
.029	.80102	59.8	.60504	80.1	.90364	32.5	.77716	58.1	53 13 40.01
0.030	0.80162	59.8	0.60563	80.2	0.90417	32.4	0.77658	58.2	53 17 06.27
.031	.80222	59.7	.60623	80.2	.90469	32.3	.77600	58.4	53 20 32.53
.032	.80281	59.6	.60682	80.3	.90521	32.3	.77541	58.5	53 23 58.80
.033	.80341	59.5	.60741	80.3	.90573	32.2	.77482	58.6	53 27 25.06
.034	.80400	59.5	.60800	80.4	.90625	32.1	.77424	58.7	53 30 51.33
0.035	0.80460	59.4	0.60858	80.5	0.90677	32.1	0.77365	58.8	53 34 17.60
.036	.80519	59.3	.60917	80.5	.90729	32.0	.77306	59.0	53 37 43.86
.037	.80579	59.2	.60975	80.6	.90781	31.9	.77247	59.1	53 41 10.12
.038	.80638	59.1	.61034	80.6	.90833	31.9	.77188	59.2	53 44 36.39
.039	.80697	59.1	.61092	80.7	.90885	31.8	.77129	59.3	53 48 02.65
0.040	0.80756	59.0	0.61150	80.8	0.90937	31.7	0.77070	59.5	53 51 28.92
.041	.80815	58.9	.61208	80.8	.90989	31.7	.77010	59.6	53 54 55.18
.042	.80874	58.8	.61266	80.9	.91041	31.6	.76950	59.7	53 58 21.45
.043	.80932	58.7	.61324	80.9	.91093	31.5	.76891	59.8	54 01 47.71
.044	.80991	58.7	.61382	81.0	.91145	31.5	.76831	60.0	54 05 13.98
0.045	0.81050	58.6	0.61440	81.1	0.91197	31.4	0.76771	60.1	54 08 40.24
.046	.81108	58.5	.61498	81.1	.91249	31.3	.76711	60.2	54 12 06.51
.047	.81167	58.4	.61556	81.2	.91301	31.3	.76650	60.3	54 15 32.77
.048	.81225	58.3	.61614	81.2	.91353	31.2	.76589	60.5	54 18 59.04
.049	.81283	58.2	.61672	81.3	.91405	31.1	.76529	60.6	54 22 25.30
0.050	0.81342	58.2	0.61730	81.3	0.91457	31.1	0.76469	60.7	54 25 51.57
u	$-\sin u$	$\sin' u$	$\cos u$	$\cos' u$	$\log \sin u$	$\log \sin' u$	$\log \cos u$	$\log \cos' u$	u

Circular Functions.

u	$\sin u$	$= F'$	$\cos u$	$= F'$	$\log \sin u$	$= F'$	$\log \cos u$	$= F'$	u
0.050	0.81342	58.2	0.58168	81.3	9.01031	31.1	9.76460	60.7	54 35 51.57
0.051	0.81400	58.1	0.58087	81.4	0.01052	31.0	9.76408	60.9	54 35 17.83
0.052	0.81458	58.0	0.58006	81.5	0.01093	30.9	9.76347	61.0	54 34 44.19
0.053	0.81516	57.9	0.57924	81.5	0.01134	30.9	9.76286	61.1	54 34 10.36
0.054	0.81574	57.8	0.57842	81.6	0.01155	30.8	9.76225	61.2	54 33 36.53
0.055	0.81631	57.8	0.57761	81.6	9.01186	30.7	9.76163	61.4	54 33 02.80
0.056	0.81689	57.7	0.57679	81.7	0.01216	30.7	9.76102	61.5	54 32 29.15
0.057	0.81747	57.6	0.57597	81.7	0.01247	30.6	9.76040	61.6	54 32 55.42
0.058	0.81804	57.5	0.57516	81.8	0.01278	30.5	9.75979	61.8	54 32 21.68
0.059	0.81862	57.4	0.57434	81.9	0.01308	30.5	9.75917	61.9	54 31 47.95
0.060	0.81919	57.4	0.57352	81.9	9.01339	30.4	9.75855	62.0	55 00 14.21
0.061	0.81976	57.3	0.57270	82.0	0.01369	30.3	9.75793	62.2	55 01 40.48
0.062	0.82034	57.2	0.57188	82.0	0.01399	30.3	9.75731	62.3	55 02 06.74
0.063	0.82091	57.1	0.57106	82.1	0.01429	30.3	9.75668	62.4	55 10 33.01
0.064	0.82148	57.0	0.57024	82.1	0.01460	30.1	9.75605	62.6	55 13 50.27
0.065	0.82205	56.9	0.56942	82.2	9.01490	30.1	9.75543	62.7	55 17 25.54
0.066	0.82262	56.8	0.56860	82.3	0.01520	30.0	9.75480	62.8	55 20 51.80
0.067	0.82319	56.8	0.56777	82.3	0.01550	29.9	9.75417	63.0	55 24 18.07
0.068	0.82375	56.7	0.56695	82.4	0.01580	29.9	9.75354	63.1	55 27 44.33
0.069	0.82432	56.6	0.56612	82.4	0.01610	29.8	9.75291	63.2	55 31 10.60
0.070	0.82489	56.5	0.56530	82.5	9.01639	29.8	9.75228	63.4	55 34 36.86
0.071	0.82546	56.4	0.56447	82.5	0.01669	29.7	9.75164	63.5	55 38 03.13
0.072	0.82603	56.4	0.56365	82.6	0.01699	29.6	9.75101	63.6	55 41 29.39
0.073	0.82659	56.3	0.56282	82.7	0.01728	29.6	9.75037	63.8	55 44 55.66
0.074	0.82716	56.2	0.56200	82.7	0.01758	29.5	9.74973	63.9	55 48 21.92
0.075	0.82773	56.1	0.56117	82.8	9.01787	29.4	9.74909	64.1	55 51 48.19
0.076	0.82829	56.0	0.56034	82.8	0.01817	29.4	9.74845	64.2	55 55 14.45
0.077	0.82886	56.0	0.55951	82.9	0.01846	29.3	9.74781	64.3	55 58 40.72
0.078	0.82942	55.9	0.55868	83.0	0.01875	29.2	9.74717	64.5	56 02 06.98
0.079	0.82999	55.8	0.55785	83.0	0.01905	29.2	9.74652	64.6	56 05 33.25
0.080	0.83056	55.7	0.55702	83.0	9.01934	29.1	9.74587	64.8	56 08 59.51
0.081	0.83112	55.6	0.55619	83.1	0.01963	29.1	9.74522	64.9	56 12 25.77
0.082	0.83168	55.5	0.55536	83.2	0.01992	29.0	9.74457	65.0	56 15 52.04
0.083	0.83224	55.5	0.55453	83.2	0.02021	28.9	9.74392	65.2	56 19 18.30
0.084	0.83279	55.4	0.55370	83.3	0.02050	28.9	9.74327	65.3	56 22 44.57
0.085	0.83335	55.3	0.55286	83.3	9.02079	28.8	9.74262	65.5	56 26 10.83
0.086	0.83391	55.2	0.55203	83.4	0.02107	28.8	9.74196	65.6	56 29 37.10
0.087	0.83446	55.1	0.55120	83.4	0.02136	28.7	9.74131	65.7	56 33 03.36
0.088	0.83502	55.0	0.55036	83.5	0.02165	28.6	9.74065	65.8	56 36 29.63
0.089	0.83558	55.0	0.54953	83.5	0.02193	28.6	9.73999	65.9	56 39 55.89
0.090	0.83613	54.9	0.54869	83.6	9.02222	28.5	9.73933	66.2	56 43 22.16
0.091	0.83669	54.8	0.54785	83.7	0.02250	28.4	9.73866	66.3	56 46 48.42
0.092	0.83724	54.7	0.54702	83.7	0.02279	28.4	9.73800	66.5	56 50 14.69
0.093	0.83779	54.6	0.54618	83.8	0.02307	28.3	9.73734	66.6	56 53 40.95
0.094	0.83834	54.5	0.54534	83.8	0.02335	28.3	9.73667	66.8	56 57 07.22
0.095	0.83889	54.5	0.54450	83.9	9.02364	28.2	9.73600	66.9	57 00 33.48
0.096	0.83944	54.4	0.54366	83.9	0.02392	28.1	9.73533	67.0	57 03 59.75
0.097	0.83998	54.3	0.54282	84.0	0.02420	28.1	9.73466	67.2	57 07 26.01
0.098	0.84053	54.2	0.54198	84.0	0.02448	28.0	9.73399	67.3	57 10 52.28
0.099	0.84108	54.1	0.54114	84.1	0.02476	27.9	9.73331	67.5	57 14 18.54
1.000	0.84147	54.0	0.54030	84.1	9.02504	27.9	9.73264	67.6	57 17 44.81
u	$= \sin u$	$= F'$	$\cosh u$	$= F'$	$\log \sin u$	$= F'$	$\log \cosh u$	$= F'$	u

Circular Functions.

u	$\sin u$	$\cos u$	$\tan u$	$\cot u$	$\log \sin u$	$\log \cos u$	$\log \tan u$	$\log \cot u$	u
1.000	0.84147	54.0	0.54030	84.1	0.02904	0.73264	67.6	57 17 44.81	
.001	.84201	53.9	.53976	84.2	.02932	.73166	67.8	57 21 11.07	
.002	.84255	53.8	.53882	84.3	.02960	.73068	67.9	57 24 37.34	
.003	.84309	53.7	.53788	84.3	.02987	.72970	68.1	57 28 03.60	
.004	.84363	53.7	.53693	84.4	.03015	.72872	68.2	57 31 29.87	
1.005	0.84416	53.6	0.53600	84.4	0.03043	0.72774	68.4	57 34 56.13	
.006	.84470	53.5	.53504	84.5	.03070	.72676	68.5	57 38 22.40	
.007	.84523	53.4	.53400	84.5	.03098	.72578	68.7	57 41 48.66	
.008	.84577	53.4	.53305	84.6	.03125	.72480	68.8	57 45 14.92	
.009	.84630	53.3	.53211	84.6	.03152	.72382	69.0	57 48 41.19	
1.010	0.84683	53.2	0.53116	84.7	0.03180	0.72284	69.1	57 52 07.45	
.011	.84736	53.1	.53021	84.7	.03207	.72186	69.3	57 55 33.72	
.012	.84789	53.0	.52927	84.8	.03234	.72088	69.5	57 58 59.98	
.013	.84842	52.9	.52832	84.8	.03261	.71990	69.6	58 02 26.25	
.014	.84895	52.8	.52737	84.9	.03288	.71892	69.8	58 05 52.51	
1.015	0.84948	52.8	0.52642	85.0	0.03315	0.71794	69.9	58 09 18.78	
.016	.85001	52.7	.52547	85.0	.03342	.71696	70.1	58 12 45.04	
.017	.85053	52.6	.52452	85.1	.03369	.71598	70.2	58 16 11.31	
.018	.85106	52.5	.52357	85.1	.03396	.71500	70.4	58 19 37.57	
.019	.85158	52.4	.52262	85.2	.03423	.71402	70.6	58 23 03.84	
1.020	0.85211	52.3	0.52167	85.2	0.03450	0.71304	70.7	58 26 30.10	
.021	.85263	52.3	.52072	85.3	.03477	.71206	70.9	58 29 56.37	
.022	.85315	52.2	.51977	85.3	.03504	.71108	71.0	58 33 22.63	
.023	.85367	52.1	.51882	85.4	.03531	.71010	71.2	58 36 48.90	
.024	.85419	52.0	.51787	85.4	.03558	.70912	71.3	58 40 15.16	
1.025	0.85471	51.9	0.51692	85.5	0.03585	0.70814	71.5	58 43 41.43	
.026	.85523	51.8	.51597	85.5	.03612	.70716	71.7	58 47 07.69	
.027	.85575	51.7	.51502	85.6	.03639	.70618	71.8	58 50 33.95	
.028	.85627	51.6	.51407	85.6	.03666	.70520	72.0	58 54 00.22	
.029	.85679	51.5	.51312	85.7	.03693	.70422	72.2	58 57 26.48	
1.030	0.85730	51.5	0.51217	85.7	0.03720	0.70324	72.3	59 00 52.75	
.031	.85782	51.4	.51122	85.8	.03747	.70226	72.5	59 04 19.02	
.032	.85834	51.3	.51027	85.8	.03774	.70128	72.6	59 07 45.28	
.033	.85886	51.2	.50932	85.9	.03801	.70030	72.8	59 11 11.54	
.034	.85938	51.1	.50837	85.9	.03828	.69932	73.0	59 14 37.81	
1.035	0.85989	51.1	0.50742	86.0	0.03855	0.69834	73.1	59 18 04.07	
.036	.86041	51.0	.50647	86.0	.03882	.69736	73.3	59 21 30.34	
.037	.86093	50.9	.50552	86.1	.03909	.69638	73.5	59 24 56.60	
.038	.86145	50.8	.50457	86.1	.03936	.69540	73.6	59 28 22.87	
.039	.86197	50.7	.50362	86.2	.03963	.69442	73.8	59 31 49.13	
1.040	0.86248	50.6	0.50267	86.2	0.03990	0.69344	74.0	59 35 15.40	
.041	.86300	50.5	.50172	86.3	.04017	.69246	74.2	59 38 41.66	
.042	.86352	50.4	.50077	86.3	.04044	.69148	74.3	59 42 07.92	
.043	.86404	50.3	.50000	86.4	.04071	.69050	74.5	59 45 34.19	
.044	.86456	50.2	.50000	86.4	.04098	.68952	74.7	59 49 00.45	
1.045	0.86507	50.2	0.50000	86.5	0.04125	0.68854	74.8	59 52 26.72	
.046	.86559	50.1	.50000	86.5	.04152	.68756	75.0	59 55 52.98	
.047	.86611	50.0	.50000	86.6	.04179	.68658	75.2	59 59 19.25	
.048	.86663	49.9	.49900	86.6	.04206	.68560	75.4	60 02 45.52	
.049	.86715	49.8	.49800	86.7	.04233	.68462	75.5	60 06 11.78	
1.050	0.86766	49.8	0.49700	86.7	0.04260	0.68364	75.7	60 09 38.05	
u	$-\sin u$	$\cos u$	$\tan u$	$\cot u$	$\log \sin u$	$\log \cos u$	$\log \tan u$	$\log \cot u$	u

SMITHSONIAN TABLES

Circular Functions.

u	$\sin u$	$= F'$	$\cos u$	$= F'$	$\log \sin u$	$= F'$	$\log \cos u$	$= F'$	u
1.050	0.85749	49.8	0.49757	86.7	9.93893	24.0	9.69986	75.7	60 09 38.05
.051	0.86792	49.7	0.49670	86.8	9.93928	24.0	9.69910	75.9	60 13 04.31
.052	0.87832	49.6	0.49584	86.8	9.93973	24.0	9.69834	76.1	60 16 30.58
.053	0.88869	49.5	0.49497	86.9	9.94018	24.7	9.69758	76.3	60 19 56.84
.054	0.89904	49.4	0.49410	86.9	9.94062	24.7	9.69681	76.4	60 23 23.11
1.055	0.90939	49.3	0.49323	87.0	9.94107	24.6	9.69605	76.6	60 26 49.37
.056	0.91972	49.2	0.49236	87.0	9.94152	24.6	9.69528	76.8	60 30 15.64
.057	0.92998	49.1	0.49149	87.1	9.94196	24.5	9.69451	77.0	60 33 41.90
.058	0.94024	49.1	0.49062	87.1	9.94241	24.5	9.69374	77.1	60 37 08.17
.059	0.95049	49.0	0.48974	87.2	9.94285	24.4	9.69297	77.3	60 40 34.43
1.060	0.96073	48.9	0.48887	87.2	9.94330	24.3	9.69220	77.5	60 44 00.69
.061	0.97094	48.8	0.48800	87.3	9.94374	24.3	9.69143	77.7	60 47 26.96
.062	0.98113	48.7	0.48713	87.3	9.94418	24.2	9.69066	77.9	60 50 53.22
.063	0.99132	48.6	0.48625	87.4	9.94462	24.2	9.68989	78.0	60 54 19.49
.064	0.99150	48.5	0.48538	87.4	9.94506	24.1	9.68912	78.2	60 57 45.75
1.065	0.99169	48.5	0.48450	87.5	9.94550	24.1	9.68835	78.4	61 01 12.02
.066	0.99187	48.4	0.48363	87.5	9.94594	24.0	9.68758	78.6	61 04 38.28
.067	0.99205	48.3	0.48275	87.6	9.94638	23.9	9.68681	78.8	61 08 04.55
.068	0.99222	48.2	0.48188	87.6	9.94682	23.9	9.68604	79.0	61 11 30.81
.069	0.99239	48.1	0.48100	87.7	9.94726	23.8	9.68527	79.2	61 14 57.08
1.070	0.99257	48.0	0.48012	87.7	9.94770	23.8	9.68450	79.3	61 18 23.34
.071	0.99274	47.9	0.47925	87.8	9.94814	23.7	9.68373	79.5	61 21 49.61
.072	0.99291	47.8	0.47837	87.8	9.94858	23.7	9.68296	79.7	61 25 15.87
.073	0.99308	47.7	0.47749	87.9	9.94902	23.6	9.68219	79.9	61 28 42.14
.074	0.99325	47.7	0.47661	87.9	9.94946	23.6	9.68142	80.1	61 32 08.40
1.075	0.99342	47.6	0.47573	88.0	9.94990	23.5	9.68065	80.3	61 35 34.67
.076	0.99359	47.5	0.47485	88.0	9.95034	23.4	9.67988	80.5	61 39 00.93
.077	0.99376	47.4	0.47397	88.1	9.95078	23.4	9.67911	80.7	61 42 27.20
.078	0.99393	47.3	0.47309	88.1	9.95122	23.3	9.67834	80.9	61 45 53.46
.079	0.99410	47.2	0.47221	88.1	9.95166	23.3	9.67757	81.1	61 49 19.73
1.080	0.99427	47.1	0.47133	88.2	9.95210	23.2	9.67680	81.3	61 52 45.99
.081	0.99444	47.0	0.47045	88.2	9.95254	23.2	9.67603	81.5	61 56 12.26
.082	0.99461	47.0	0.46957	88.3	9.95298	23.1	9.67526	81.7	61 59 38.52
.083	0.99478	46.9	0.46869	88.3	9.95342	23.0	9.67449	81.9	62 03 04.79
.084	0.99495	46.8	0.46781	88.4	9.95386	23.0	9.67372	82.1	62 06 31.05
1.085	0.99512	46.7	0.46693	88.4	9.95430	22.9	9.67295	82.3	62 09 57.31
.086	0.99529	46.6	0.46605	88.5	9.95474	22.9	9.67218	82.5	62 13 23.58
.087	0.99546	46.5	0.46517	88.5	9.95518	22.8	9.67141	82.7	62 16 49.84
.088	0.99563	46.4	0.46429	88.6	9.95562	22.8	9.67064	82.9	62 20 16.11
.089	0.99580	46.3	0.46341	88.6	9.95606	22.7	9.66987	83.1	62 23 42.37
1.090	0.99597	46.2	0.46253	88.7	9.95650	22.7	9.66910	83.3	62 27 08.64
.091	0.99614	46.2	0.46165	88.7	9.95694	22.6	9.66833	83.5	62 30 34.90
.092	0.99631	46.1	0.46077	88.8	9.95738	22.5	9.66756	83.7	62 34 01.17
.093	0.99648	46.0	0.45989	88.8	9.95782	22.5	9.66679	83.9	62 37 27.43
.094	0.99665	45.9	0.45901	88.8	9.95826	22.4	9.66602	84.1	62 40 53.70
1.095	0.99682	45.8	0.45813	88.9	9.95870	22.4	9.66525	84.3	62 44 19.96
.096	0.99699	45.7	0.45725	89.0	9.95914	22.3	9.66448	84.5	62 47 46.23
.097	0.99716	45.6	0.45637	89.0	9.95958	22.3	9.66371	84.7	62 51 12.49
.098	0.99733	45.5	0.45549	89.1	9.96002	22.2	9.66294	84.9	62 54 38.76
.099	0.99750	45.4	0.45461	89.1	9.96046	22.2	9.66217	85.1	62 58 05.02
1.100	0.99767	45.4	0.45373	89.1	9.96090	22.1	9.66140	85.3	63 01 31.29
u	$-\sin u$	$= F'$	$\cos u$	$= F'$	$\log \frac{\sin u}{1}$	$= F'$	$\log \cos u$	$= F'$	u

Circular Functions.

u	$\sin u$	$= F_1'$	$\cos u$	$= F_2'$	$\log \sin u$	$= F_3'$	$\log \cos u$	$= F_4'$	u
1. 100	0.89121	45.4	0.45360	80.1	9.94998	22.1	9.09667	85.3	63 01 31.20
101	.89066	45.3	.45270	80.2	.95020	22.0	.65981	85.5	63 04 57.55
102	.89011	45.2	.45181	80.3	.95042	22.0	.65960	85.8	63 08 25.81
103	.88956	45.1	.45092	80.3	.95064	21.9	.65939	86.0	63 11 50.08
104	.88901	45.0	.45003	80.3	.95086	21.9	.65918	86.2	63 15 16.35
1. 105	0.88846	44.9	0.44913	80.3	9.95108	21.8	9.65238	86.4	63 18 42.61
106	.88791	44.8	.44824	80.4	.95130	21.8	.65151	86.6	63 22 08.88
107	.88736	44.7	.44735	80.4	.95151	21.7	.65064	86.8	63 25 35.14
108	.88681	44.6	.44645	80.5	.95173	21.7	.64977	87.0	63 29 01.41
109	.88625	44.6	.44556	80.5	.95195	21.6	.64890	87.3	63 32 27.67
1. 110	0.88570	44.5	0.44466	80.6	9.95216	21.6	9.64803	87.5	63 35 53.93
111	.88514	44.4	.44377	80.6	.95238	21.5	.64715	87.7	63 39 20.20
112	.88459	44.3	.44287	80.7	.95259	21.5	.64628	87.9	63 42 46.46
113	.88403	44.2	.44197	80.7	.95281	21.4	.64540	88.1	63 46 12.73
114	.88347	44.1	.44108	80.7	.95302	21.3	.64451	88.4	63 49 38.99
1. 115	0.88291	44.0	0.44018	80.8	9.95323	21.3	9.64363	88.6	63 53 05.26
116	.88235	43.9	.43928	80.8	.95345	21.2	.64274	88.8	63 56 31.52
117	.88179	43.8	.43838	80.9	.95366	21.2	.64185	89.0	63 59 57.79
118	.88123	43.7	.43748	80.9	.95387	21.1	.64096	89.3	64 03 24.05
119	.88066	43.7	.43658	80.9	.95408	21.1	.64007	89.5	64 06 50.31
1. 120	0.88010	43.6	0.43568	80.0	9.95429	21.0	9.63917	89.7	64 10 16.58
121	.87954	43.5	.43478	80.1	.95450	21.0	.63827	90.0	64 13 42.85
122	.87897	43.4	.43388	80.1	.95471	20.9	.63737	90.2	64 17 09.11
123	.87841	43.3	.43298	80.1	.95492	20.9	.63647	90.4	64 20 35.38
124	.87784	43.2	.43208	80.2	.95513	20.8	.63556	90.6	64 24 01.64
1. 125	0.87727	43.1	0.43118	80.2	9.95534	20.8	9.63466	90.9	64 27 27.91
126	.87670	43.0	.43027	80.3	.95554	20.7	.63375	91.1	64 30 54.17
127	.87613	42.9	.42937	80.3	.95575	20.6	.63283	91.3	64 34 20.44
128	.87556	42.8	.42847	80.4	.95596	20.6	.63192	91.6	64 37 46.70
129	.87500	42.8	.42756	80.4	.95616	20.5	.63100	91.8	64 41 12.97
1. 130	0.87443	42.7	0.42666	80.4	9.95637	20.5	9.63008	92.1	64 44 39.23
131	.87386	42.6	.42576	80.5	.95657	20.4	.62916	92.3	64 48 05.50
132	.87329	42.5	.42485	80.5	.95678	20.4	.62824	92.5	64 51 31.76
133	.87272	42.4	.42394	80.6	.95698	20.3	.62731	92.8	64 54 58.03
134	.87215	42.3	.42304	80.6	.95718	20.3	.62638	93.0	64 58 24.29
1. 135	0.87158	42.2	0.42213	80.7	9.95738	20.2	9.62545	93.3	65 01 50.56
136	.87101	42.1	.42123	80.7	.95759	20.2	.62451	93.5	65 05 16.82
137	.87044	42.0	.42032	80.7	.95779	20.1	.62358	93.8	65 08 43.08
138	.86987	41.9	.41941	80.8	.95799	20.1	.62265	94.0	65 12 09.35
139	.86930	41.8	.41850	80.8	.95819	20.0	.62170	94.2	65 15 35.61
1. 140	0.86873	41.7	0.41759	80.9	9.95839	20.0	9.62075	94.5	65 19 01.88
141	.86816	41.7	.41669	80.9	.95859	19.9	.61981	94.7	65 22 28.14
142	.86759	41.6	.41578	80.9	.95879	19.9	.61886	95.0	65 25 54.41
143	.86702	41.5	.41487	81.0	.95899	19.8	.61791	95.3	65 29 20.67
144	.86645	41.4	.41396	81.0	.95918	19.7	.61695	95.5	65 32 46.94
1. 145	0.86588	41.3	0.41305	81.1	9.95938	19.7	9.61600	95.8	65 36 13.20
146	.86531	41.2	.41214	81.1	.95958	19.6	.61504	96.0	65 39 39.47
147	.86474	41.1	.41123	81.2	.95977	19.6	.61408	96.3	65 43 05.73
148	.86417	41.0	.41031	81.2	.95996	19.5	.61311	96.5	65 46 32.00
149	.86360	40.9	.40940	81.2	.96016	19.5	.61215	96.8	65 49 58.26
1. 150	0.86303	40.8	0.40849	81.3	9.96036	19.4	9.61118	97.0	65 53 24.53
u	$-\tanh u$	$= F_1'$	$\cosh u$	$= F_2'$	$\log \frac{\sinh u}{u}$	$= F_3'$	$\log \cosh u$	$= F_4'$	u

Circular Functions.

x	$\sin x$	$\cos x$	$\tan x$	$\cot x$	$\log \sin x$	$\log \cos x$	$\log \tan x$	$\log \cot x$	x
1.200	0.93204	0.362	0.362	0.362	0.93204	0.362	0.362	0.362	1.200
.201	0.93240	0.361	0.361	0.361	0.93240	0.361	0.361	0.361	.201
.202	0.93276	0.360	0.360	0.360	0.93276	0.360	0.360	0.360	.202
.203	0.93312	0.359	0.359	0.359	0.93312	0.359	0.359	0.359	.203
.204	0.93348	0.358	0.358	0.358	0.93348	0.358	0.358	0.358	.204
1.205	0.93384	0.357	0.357	0.357	0.93384	0.357	0.357	0.357	1.205
.206	0.93420	0.356	0.356	0.356	0.93420	0.356	0.356	0.356	.206
.207	0.93455	0.355	0.355	0.355	0.93455	0.355	0.355	0.355	.207
.208	0.93491	0.354	0.354	0.354	0.93491	0.354	0.354	0.354	.208
.209	0.93526	0.353	0.353	0.353	0.93526	0.353	0.353	0.353	.209
1.210	0.93562	0.352	0.352	0.352	0.93562	0.352	0.352	0.352	1.210
.211	0.93597	0.351	0.351	0.351	0.93597	0.351	0.351	0.351	.211
.212	0.93632	0.350	0.350	0.350	0.93632	0.350	0.350	0.350	.212
.213	0.93667	0.349	0.349	0.349	0.93667	0.349	0.349	0.349	.213
.214	0.93702	0.348	0.348	0.348	0.93702	0.348	0.348	0.348	.214
1.215	0.93737	0.347	0.347	0.347	0.93737	0.347	0.347	0.347	1.215
.216	0.93772	0.346	0.346	0.346	0.93772	0.346	0.346	0.346	.216
.217	0.93806	0.345	0.345	0.345	0.93806	0.345	0.345	0.345	.217
.218	0.93841	0.344	0.344	0.344	0.93841	0.344	0.344	0.344	.218
.219	0.93875	0.343	0.343	0.343	0.93875	0.343	0.343	0.343	.219
1.220	0.93910	0.342	0.342	0.342	0.93910	0.342	0.342	0.342	1.220
.221	0.93944	0.341	0.341	0.341	0.93944	0.341	0.341	0.341	.221
.222	0.93978	0.340	0.340	0.340	0.93978	0.340	0.340	0.340	.222
.223	0.94012	0.339	0.339	0.339	0.94012	0.339	0.339	0.339	.223
.224	0.94046	0.338	0.338	0.338	0.94046	0.338	0.338	0.338	.224
1.225	0.94081	0.337	0.337	0.337	0.94081	0.337	0.337	0.337	1.225
.226	0.94114	0.336	0.336	0.336	0.94114	0.336	0.336	0.336	.226
.227	0.94148	0.335	0.335	0.335	0.94148	0.335	0.335	0.335	.227
.228	0.94182	0.334	0.334	0.334	0.94182	0.334	0.334	0.334	.228
.229	0.94215	0.333	0.333	0.333	0.94215	0.333	0.333	0.333	.229
1.230	0.94249	0.332	0.332	0.332	0.94249	0.332	0.332	0.332	1.230
.231	0.94282	0.331	0.331	0.331	0.94282	0.331	0.331	0.331	.231
.232	0.94316	0.330	0.330	0.330	0.94316	0.330	0.330	0.330	.232
.233	0.94349	0.329	0.329	0.329	0.94349	0.329	0.329	0.329	.233
.234	0.94382	0.328	0.328	0.328	0.94382	0.328	0.328	0.328	.234
1.235	0.94415	0.327	0.327	0.327	0.94415	0.327	0.327	0.327	1.235
.236	0.94448	0.326	0.326	0.326	0.94448	0.326	0.326	0.326	.236
.237	0.94481	0.325	0.325	0.325	0.94481	0.325	0.325	0.325	.237
.238	0.94514	0.324	0.324	0.324	0.94514	0.324	0.324	0.324	.238
.239	0.94546	0.323	0.323	0.323	0.94546	0.323	0.323	0.323	.239
1.240	0.94579	0.322	0.322	0.322	0.94579	0.322	0.322	0.322	1.240
.241	0.94611	0.321	0.321	0.321	0.94611	0.321	0.321	0.321	.241
.242	0.94643	0.320	0.320	0.320	0.94643	0.320	0.320	0.320	.242
.243	0.94675	0.319	0.319	0.319	0.94675	0.319	0.319	0.319	.243
.244	0.94708	0.318	0.318	0.318	0.94708	0.318	0.318	0.318	.244
1.245	0.94740	0.317	0.317	0.317	0.94740	0.317	0.317	0.317	1.245
.246	0.94772	0.316	0.316	0.316	0.94772	0.316	0.316	0.316	.246
.247	0.94803	0.315	0.315	0.315	0.94803	0.315	0.315	0.315	.247
.248	0.94835	0.314	0.314	0.314	0.94835	0.314	0.314	0.314	.248
.249	0.94867	0.313	0.313	0.313	0.94867	0.313	0.313	0.313	.249
1.250	0.94898	0.312	0.312	0.312	0.94898	0.312	0.312	0.312	1.250
x	$-\log \sin x$	$\log \cos x$	$\log \tan x$	$\log \cot x$	x	$-\log \sin x$	$\log \cos x$	$\log \cot x$	x

Circular Functions.

θ	$\sin \theta$	$\cos \theta$	$\tan \theta$	$\cot \theta$	$\sec \theta$	$\csc \theta$	θ	$\sin \theta$	$\cos \theta$	$\tan \theta$	$\cot \theta$	$\sec \theta$	$\csc \theta$
1.250	0.91648	0.40152	2.283	0.4378	1.245	1.250	1.250	0.91648	0.40152	2.283	0.4378	1.245	1.250
.251	0.91690	0.40100	2.284	0.4373	1.246	1.251	.252	0.91732	0.40048	2.285	0.4368	1.247	1.252
.253	0.91772	0.39995	2.286	0.4363	1.248	1.253	.254	0.91814	0.39940	2.287	0.4358	1.249	1.254
.255	0.91856	0.39885	2.288	0.4348	1.250	1.255	.256	0.91898	0.39825	2.289	0.4343	1.251	1.256
.257	0.91940	0.39765	2.290	0.4333	1.252	1.257	.258	0.91982	0.39705	2.291	0.4328	1.253	1.258
.259	0.92024	0.39645	2.292	0.4318	1.254	1.259	.260	0.92066	0.39585	2.293	0.4313	1.255	1.260
.261	0.92108	0.39525	2.294	0.4303	1.256	1.261	.262	0.92150	0.39465	2.295	0.4298	1.257	1.262
.263	0.92192	0.39405	2.296	0.4288	1.258	1.263	.264	0.92234	0.39345	2.297	0.4283	1.259	1.264
.265	0.92276	0.39285	2.298	0.4273	1.260	1.265	.266	0.92318	0.39225	2.299	0.4268	1.261	1.266
.267	0.92360	0.39165	2.300	0.4258	1.262	1.267	.268	0.92402	0.39105	2.301	0.4253	1.263	1.268
.269	0.92444	0.39045	2.302	0.4243	1.264	1.269	.270	0.92486	0.38985	2.303	0.4238	1.265	1.270
.271	0.92528	0.38925	2.304	0.4228	1.266	1.271	.272	0.92570	0.38865	2.305	0.4223	1.267	1.272
.273	0.92612	0.38805	2.306	0.4213	1.268	1.273	.274	0.92654	0.38745	2.307	0.4208	1.269	1.274
.275	0.92696	0.38685	2.308	0.4203	1.270	1.275	.276	0.92738	0.38625	2.309	0.4198	1.271	1.276
.277	0.92780	0.38565	2.310	0.4188	1.272	1.277	.278	0.92822	0.38505	2.311	0.4183	1.273	1.278
.279	0.92864	0.38445	2.312	0.4173	1.274	1.279	.280	0.92906	0.38385	2.313	0.4168	1.275	1.280
.281	0.92948	0.38325	2.314	0.4158	1.276	1.281	.282	0.92990	0.38265	2.315	0.4153	1.277	1.282
.283	0.93032	0.38205	2.316	0.4143	1.278	1.283	.284	0.93074	0.38145	2.317	0.4138	1.279	1.284
.285	0.93116	0.38085	2.318	0.4128	1.280	1.285	.286	0.93158	0.38025	2.319	0.4123	1.281	1.286
.287	0.93200	0.37965	2.320	0.4113	1.282	1.287	.288	0.93242	0.37905	2.321	0.4108	1.283	1.288
.289	0.93244	0.37845	2.322	0.4098	1.284	1.289	.290	0.93286	0.37785	2.323	0.4093	1.285	1.290
.291	0.93328	0.37725	2.324	0.4083	1.286	1.291	.292	0.93370	0.37665	2.325	0.4078	1.287	1.292
.293	0.93412	0.37605	2.326	0.4068	1.288	1.293	.294	0.93454	0.37545	2.327	0.4063	1.289	1.294
.295	0.93496	0.37485	2.328	0.4053	1.290	1.295	.296	0.93538	0.37425	2.329	0.4048	1.291	1.296
.297	0.93580	0.37365	2.330	0.4038	1.292	1.297	.298	0.93622	0.37305	2.331	0.4033	1.293	1.298
.299	0.93664	0.37245	2.332	0.4023	1.294	1.299	.300	0.93706	0.37185	2.333	0.4018	1.295	1.300
.301	0.93750	0.37125	2.334	0.4008	1.296	1.301	.302	0.93792	0.37065	2.335	0.4003	1.297	1.302
.303	0.93834	0.37005	2.336	0.3993	1.298	1.303	.304	0.93876	0.36945	2.337	0.3988	1.299	1.304
.305	0.93918	0.36885	2.338	0.3978	1.300	1.305	.306	0.93960	0.36825	2.339	0.3973	1.301	1.306
.307	0.94002	0.36765	2.340	0.3963	1.302	1.307	.308	0.94044	0.36705	2.341	0.3958	1.303	1.308
.309	0.94086	0.36645	2.342	0.3948	1.304	1.309	.310	0.94128	0.36625	2.343	0.3943	1.305	1.310
.311	0.94170	0.36565	2.344	0.3933	1.306	1.311	.312	0.94212	0.36505	2.345	0.3928	1.307	1.312
.313	0.94254	0.36445	2.346	0.3918	1.308	1.313	.314	0.94296	0.36425	2.347	0.3913	1.309	1.314
.315	0.94298	0.36385	2.348	0.3903	1.310	1.315	.316	0.94340	0.36365	2.349	0.3898	1.311	1.316
.317	0.94382	0.36325	2.350	0.3888	1.312	1.317	.318	0.94424	0.36305	2.351	0.3883	1.313	1.318
.319	0.94466	0.36245	2.352	0.3868	1.314	1.319	.320	0.94508	0.36225	2.353	0.3863	1.315	1.320
.321	0.94550	0.36185	2.354	0.3853	1.316	1.321	.322	0.94592	0.36165	2.355	0.3848	1.317	1.322
.323	0.94634	0.36125	2.356	0.3838	1.318	1.323	.324	0.94676	0.36105	2.357	0.3833	1.319	1.324
.325	0.94678	0.36065	2.358	0.3823	1.320	1.325	.326	0.94720	0.36045	2.359	0.3818	1.321	1.326
.327	0.94762	0.36025	2.360	0.3808	1.322	1.327	.328	0.94804	0.36005	2.361	0.3803	1.323	1.328
.329	0.94806	0.35985	2.362	0.3793	1.324	1.329	.330	0.94848	0.35965	2.363	0.3788	1.325	1.330
.331	0.94890	0.35945	2.364	0.3778	1.326	1.331	.332	0.94932	0.35925	2.365	0.3773	1.327	1.332
.333	0.94974	0.35905	2.366	0.3763	1.328	1.333	.334	0.95016	0.35905	2.367	0.3758	1.329	1.334
.335	0.95058	0.35865	2.368	0.3748	1.330	1.335	.336	0.95100	0.35845	2.369	0.3743	1.331	1.336
.337	0.95142	0.35825	2.370	0.3733	1.332	1.337	.338	0.95184	0.35805	2.371	0.3728	1.333	1.338
.339	0.95226	0.35785	2.372	0.3718	1.334	1.339	.340	0.95268	0.35765	2.373	0.3713	1.335	1.340
.341	0.95310	0.35745	2.374	0.3703	1.336	1.341	.342	0.95352	0.35725	2.375	0.3698	1.337	1.342
.343	0.95394	0.35705	2.376	0.3688	1.338	1.343	.344	0.95436	0.35705	2.377	0.3683	1.339	1.344
.345	0.95478	0.35665	2.378	0.3673	1.340	1.345	.346	0.95520	0.35645	2.379	0.3668	1.341	1.346
.347	0.95562	0.35625	2.380	0.3658	1.342	1.347	.348	0.95604	0.35605	2.381	0.3653	1.343	1.348
.349	0.95606	0.35605	2.382	0.3643	1.344	1.349	.350	0.95648	0.35605	2.383	0.3638	1.345	1.350
.351	0.95690	0.35605	2.384	0.3628	1.346	1.351	.352	0.95732	0.35605	2.385	0.3623	1.347	1.352
.353	0.95774	0.35605	2.386	0.3608	1.348	1.353	.354	0.95816	0.35605	2.387	0.3603	1.349	1.354
.355	0.95818	0.35605	2.388	0.3593	1.350	1.355	.356	0.95860	0.35605	2.389	0.3578	1.351	1.356
.357	0.95862	0.35605	2.390	0.3578	1.352	1.357	.358	0.95904	0.35605	2.391	0.3563	1.353	1.358
.359	0.95906	0.35605	2.392	0.3558	1.354	1.359	.360	0.95948	0.35605	2.393	0.3548	1.355	1.360
.361	0.95990	0.35605	2.394	0.3543	1.356	1.361	.362	0.96032	0.35605	2.395	0.3528	1.357	1.362
.363	0.96074	0.35605	2.396	0.3528	1.358	1.363	.364	0.96116	0.35605	2.397	0.3513	1.359	1.364
.365	0.96160	0.35605	2.398	0.3508	1.360	1.365	.366	0.96204	0.35605	2.399	0.3493	1.361	1.366
.367	0.96248	0.35605	2.400	0.3488	1.362	1.367	.368	0.96292	0.35605	2.401	0.3478	1.363	1.368
.369	0.96332	0.35605	2.402	0.3468	1.364	1.369	.370	0.96376	0.35605	2.403	0.3458	1.365	1.370
.371	0.96416	0.35605	2.404	0.3448	1.366	1.371	.372	0.96460	0.35605	2.405	0.3438	1.367	1.372
.373	0.96500	0.35605	2.406	0.3428	1.368	1.373	.374	0.96544	0.35605	2.407	0.3418	1.369	1.374
.375	0.96584	0.35605	2.408	0.3408	1.370	1.375	.376	0.96628	0.35605	2.409	0.3398	1.371	1.376
.377	0.96672	0.35605	2.410	0.3388	1.372	1.377	.378	0.96716	0.35605	2.411	0.3378	1.373	1.378
.379	0.96760	0.35605	2.412	0.3368	1.374	1.379	.380	0.96804	0.35605	2.413	0.3358	1.375	1.380
.381	0.96848	0.35605	2.414	0.3348	1.376	1.381	.382	0.96892	0.35605	2.415	0.3338	1.377	1.382
.383	0.96932	0.35605	2.416	0.3328	1.378	1.383	.384	0.97020	0.35605	2.417	0.3318	1.379	1.384
.385	0.97064	0.35605	2.418	0.3308	1.380	1.385	.386	0.97152	0.35605	2.419	0.3298	1.381	1.386
.387	0.97240	0.35605	2.420	0.3288	1.382	1.387	.388	0.97288	0.35605	2.421	0.3278	1.383	1.388
.389	0.97336	0.35605	2.422	0.3268	1.384	1.389	.390	0.97424	0.35605	2.423	0.3258	1.385	1.390
.391	0.97472	0.35605	2.424	0.3248	1.386	1.391	.392	0.97560	0.35605	2.425	0.3238	1.387	1.392
.393	0.97616	0.35605	2.426	0.3228	1.388	1.393	.394	0.97704	0.35605	2.427	0.3218	1.389	1.394
.395	0.97760	0.35605	2.428	0.3208	1.390	1.395	.396	0.97848	0.35605	2.429	0.3198	1.391	1.396
.397	0.97904	0.35605	2.430	0.3188	1.392	1.397	.398	0.98032	0.35605	2.431	0.3178	1.393	1.398
.399	0.98088	0.35605	2.432	0.3168	1.394	1.399	.400	0.98176	0.35605	2.433	0.3158	1.395	1.400
.401	0.98272	0.35605	2.434	0.3148	1.396	1.401	.402	0.98368	0.35605	2.435	0.3138	1.397	1.402
.403	0.98416	0.35605	2.436	0.3128	1.398	1.403	.404	0.98512	0.35605	2.437	0.3118	1.399	1.404
.405	0.98560	0.35605	2.438	0.3108	1.400	1.405	.406	0.98656	0.35605	2.439	0.3098	1.401	1.406
.407	0.98704	0.35605	2.440	0.3088	1.402	1.407	.408	0.98752	0.35605	2.441	0.3078	1.403	

Circular Functions.

u	$\sin u$	$= F'$	$\cos u$	$= F'$	$\log \sin u$	$= F'$	$\log \cos u$	$= F'$	u
1.300	0.96336	25.7	0.26750	95.4	9.98388	12.1	9.42732	195.4	74 20 04.25
.301	.96383	25.7	.26651	95.4	.98400	12.0	.42573	193.0	74 34 30.51
.302	.96429	25.6	.26557	95.4	.98412	12.0	.42418	190.7	74 58 56.78
.303	.96476	25.5	.26461	95.4	.98424	11.9	.42265	188.3	75 23 34.04
.304	.96522	25.4	.26364	95.5	.98436	11.9	.42113	186.0	75 48 49.31
1.305	0.96568	25.3	0.26268	95.5	9.98447	11.8	9.41942	183.5	76 23 15.57
.306	.96615	25.2	.26171	95.5	.98459	11.8	.41789	181.2	76 48 41.84
.307	.96661	25.1	.26075	95.5	.98471	11.7	.41632	178.8	77 23 08.10
.308	.96707	25.0	.25978	95.6	.98483	11.7	.41476	176.4	77 48 34.37
.309	.96753	24.9	.25881	95.6	.98494	11.6	.41320	174.1	78 23 00.63
1.310	0.96798	24.8	0.25785	95.6	9.98506	11.6	9.41137	171.7	78 48 26.90
.311	.96844	24.7	.25688	95.6	.98518	11.5	.40974	169.4	79 23 03.16
.312	.96890	24.6	.25592	95.7	.98529	11.5	.40816	167.0	79 48 19.43
.313	.96935	24.5	.25495	95.7	.98541	11.5	.40656	164.7	80 23 45.69
.314	.96979	24.4	.25398	95.7	.98552	11.4	.40498	162.3	80 48 11.95
1.315	0.96976	24.3	0.25302	95.7	9.98563	11.4	9.40315	160.1	81 23 38.22
.316	.96971	24.2	.25205	95.8	.98575	11.3	.40148	157.7	81 48 04.49
.317	.96977	24.1	.25108	95.8	.98587	11.3	.39981	155.4	82 23 30.75
.318	.96982	24.0	.25011	95.8	.98599	11.2	.39814	153.1	82 48 07.01
.319	.96987	24.0	.24914	95.8	.98608	11.2	.39646	150.8	83 23 33.28
1.320	0.96982	24.8	0.24818	95.9	9.98620	11.1	9.39476	148.5	83 48 49.54
.321	.96986	24.7	.24721	95.9	.98631	11.1	.39306	146.2	84 23 15.81
.322	.96991	24.6	.24624	95.9	.98642	11.0	.39135	143.9	84 48 42.07
.323	.96996	24.5	.24527	95.9	.98653	11.0	.38964	141.7	85 23 08.34
.324	.96997	24.4	.24430	95.9	.98664	10.9	.38792	139.4	85 48 34.60
1.325	0.96994	24.3	0.24333	97.0	9.98675	10.9	9.38610	137.1	86 23 00.87
.326	.97019	24.2	.24236	97.0	.98686	10.8	.38440	134.9	86 48 27.13
.327	.97013	24.1	.24139	97.0	.98696	10.8	.38272	132.6	87 23 03.40
.328	.97007	24.0	.24042	97.1	.98707	10.7	.38104	130.4	87 48 29.66
.329	.97001	23.9	.23945	97.1	.98718	10.7	.37937	128.1	88 23 05.93
1.330	0.97115	23.8	0.23848	97.1	9.98729	10.7	9.37744	126.0	88 48 32.19
.331	.97130	23.8	.23750	97.1	.98739	10.6	.37577	123.7	89 23 08.46
.332	.97168	23.7	.23653	97.2	.98750	10.6	.37409	121.5	89 48 34.72
.333	.97185	23.6	.23556	97.2	.98760	10.5	.37240	119.2	90 23 10.99
.334	.97209	23.5	.23459	97.2	.98771	10.5	.37071	117.0	90 48 37.25
1.335	0.97233	23.4	0.23362	97.2	9.98781	10.4	9.36881	114.8	91 23 13.52
.336	.97250	23.3	.23264	97.3	.98792	10.4	.36710	112.6	91 48 39.78
.337	.97279	23.2	.23167	97.3	.98802	10.3	.36539	110.4	92 23 16.05
.338	.97293	23.1	.23070	97.3	.98812	10.3	.36368	108.2	92 48 42.31
.339	.97316	23.0	.22973	97.3	.98823	10.3	.36197	106.0	93 23 08.58
40	0.97348	22.9	0.22875	97.3	9.98833	10.2	9.35937	103.8	93 48 34.84
41	.97371	22.8	.22778	97.4	.98843	10.2	.35767	101.7	94 23 11.11
42	.97394	22.7	.22681	97.4	.98853	10.1	.35596	99.5	94 48 37.37
43	.97417	22.6	.22584	97.4	.98863	10.1	.35426	97.3	95 23 13.63
44	.97439	22.5	.22486	97.4	.98873	10.0	.35255	95.2	95 48 39.89
1.345	0.97462	22.4	0.22388	97.5	9.98883	10.0	9.35002	93.0	96 23 16.16
.346	.97484	22.3	.22291	97.5	.98893	9.9	.34831	90.9	96 48 42.43
.347	.97506	22.2	.22193	97.5	.98903	9.9	.34660	88.7	97 23 18.69
.348	.97528	22.1	.22096	97.5	.98913	9.8	.34489	86.6	97 48 44.95
.349	.97550	22.0	.21998	97.6	.98923	9.8	.34318	84.5	98 23 21.22
1.350	0.97572	21.9	0.21901	97.6	9.98933	9.7	9.34046	82.3	98 48 47.49
u	$-\sin u$	$= F'$	$\cosh u$	$= F'$	$\log \sinh u$	$= F'$	$\log \cosh u$	$= F'$	u

Circular Functions.

u	$\sin u$	$\cos u$	$\tan u$	$\cot u$	$\sec u$	$\csc u$	$\log \sin u$	$\log \cos u$	$\log \tan u$	u
1.350	0.97572	21.0	0.21901	97.6	9.98933	0.7	9.34046	103.5	77 20 57.40	
1.351	0.97594	21.8	0.21803	97.6	9.98942	0.7	9.33852	104.4	77 21 23.75	
1.352	0.97616	21.7	0.21705	97.6	9.98952	0.7	9.33657	105.3	77 22 00.02	
1.353	0.97638	21.6	0.21608	97.6	9.98962	0.6	9.33461	106.2	77 21 16.28	
1.354	0.97660	21.5	0.21510	97.7	9.98971	0.6	9.33264	107.2	77 24 42.55	
1.355	0.97681	21.4	0.21413	97.7	9.98981	0.5	9.33067	108.1	77 28 08.81	
1.356	0.97702	21.3	0.21315	97.7	9.98990	0.5	9.32868	109.1	77 41 35.08	
1.357	0.97723	21.2	0.21217	97.7	9.99000	0.4	9.32669	109.0	77 45 01.34	
1.358	0.97744	21.1	0.21119	97.7	9.99009	0.4	9.32469	109.0	77 48 27.61	
1.359	0.97765	21.0	0.21022	97.8	9.99019	0.3	9.32267	109.0	77 51 53.87	
1.360	0.97786	20.9	0.20924	97.8	9.99028	0.3	9.32064	109.0	77 55 20.14	
1.361	0.97807	20.8	0.20826	97.8	9.99037	0.2	9.31861	109.0	77 58 46.40	
1.362	0.97828	20.7	0.20728	97.8	9.99046	0.2	9.31658	109.0	78 02 12.67	
1.363	0.97849	20.6	0.20630	97.8	9.99055	0.2	9.31455	109.0	78 05 38.93	
1.364	0.97869	20.5	0.20533	97.9	9.99065	0.1	9.31244	109.0	78 09 05.20	
1.365	0.97890	20.4	0.20435	97.9	9.99074	0.1	9.31037	108.0	78 12 31.46	
1.366	0.97910	20.3	0.20337	97.9	9.99083	0.0	9.30828	109.1	78 15 57.73	
1.367	0.97931	20.2	0.20239	97.9	9.99092	0.0	9.30619	110.1	78 19 23.99	
1.368	0.97951	20.1	0.20141	98.0	9.99101	8.0	9.30408	111.2	78 22 50.25	
1.369	0.97971	20.0	0.20043	98.0	9.99110	8.0	9.30196	112.3	78 26 16.52	
1.370	0.97991	19.9	0.19945	98.0	9.99119	8.8	9.29983	113.4	78 29 42.78	
1.371	0.98011	19.8	0.19847	98.0	9.99127	8.8	9.29769	114.5	78 33 09.05	
1.372	0.98031	19.7	0.19749	98.0	9.99136	8.7	9.29554	115.6	78 36 35.31	
1.373	0.98050	19.6	0.19651	98.1	9.99145	8.7	9.29338	116.7	78 40 01.58	
1.374	0.98070	19.5	0.19553	98.1	9.99154	8.7	9.29121	117.8	78 43 27.84	
1.375	0.98089	19.5	0.19455	98.1	9.99162	8.6	9.28903	118.0	78 46 54.11	
1.376	0.98109	19.4	0.19357	98.1	9.99171	8.6	9.28683	120.1	78 50 20.37	
1.377	0.98128	19.3	0.19259	98.1	9.99179	8.5	9.28462	121.3	78 53 46.64	
1.378	0.98147	19.2	0.19160	98.1	9.99188	8.5	9.28240	122.5	78 57 12.90	
1.379	0.98166	19.1	0.19062	98.2	9.99196	8.4	9.28017	123.7	79 00 39.17	
1.380	0.98185	19.0	0.18964	98.2	9.99205	8.4	9.27793	124.0	79 04 05.43	
1.381	0.98204	18.9	0.18866	98.2	9.99213	8.3	9.27568	125.1	79 07 31.70	
1.382	0.98223	18.8	0.18768	98.2	9.99221	8.3	9.27341	127.3	79 10 57.96	
1.383	0.98242	18.7	0.18669	98.2	9.99230	8.3	9.27113	128.5	79 14 24.23	
1.384	0.98260	18.6	0.18571	98.3	9.99238	8.2	9.26884	129.8	79 17 50.49	
1.385	0.98279	18.5	0.18473	98.3	9.99246	8.2	9.26654	131.1	79 21 16.76	
1.386	0.98297	18.4	0.18375	98.3	9.99254	8.1	9.26423	132.3	79 24 43.02	
1.387	0.98316	18.3	0.18276	98.3	9.99262	8.1	9.26189	133.6	79 28 09.29	
1.388	0.98334	18.2	0.18178	98.3	9.99270	8.0	9.25955	134.9	79 31 35.55	
1.389	0.98352	18.1	0.18080	98.4	9.99278	8.0	9.25719	136.3	79 35 01.82	
1.390	0.98370	18.0	0.17981	98.4	9.99285	7.9	9.25482	137.6	79 38 28.08	
1.391	0.98388	17.9	0.17883	98.4	9.99294	7.9	9.25244	138.0	79 41 54.35	
1.392	0.98406	17.8	0.17785	98.4	9.99302	7.8	9.25004	139.3	79 45 20.61	
1.393	0.98424	17.7	0.17686	98.4	9.99310	7.8	9.24763	140.7	79 48 46.88	
1.394	0.98441	17.6	0.17588	98.4	9.99318	7.8	9.24521	142.1	79 52 13.14	
1.395	0.98459	17.5	0.17489	98.5	9.99325	7.7	9.24277	143.5	79 55 39.40	
1.396	0.98476	17.4	0.17391	98.5	9.99333	7.7	9.24032	145.0	79 59 05.67	
1.397	0.98494	17.3	0.17292	98.5	9.99341	7.6	9.23785	146.4	80 02 31.93	
1.398	0.98511	17.2	0.17194	98.5	9.99348	7.6	9.23537	147.8	80 05 58.20	
1.399	0.98528	17.1	0.17095	98.5	9.99356	7.5	9.23288	149.3	80 09 24.46	
1.400	0.98545	17.0	0.16997	98.5	9.99363	7.5	9.23036	150.8	80 12 50.73	
u	$-\sin u$	$\cos u$	$\tan u$	$\cot u$	$\sec u$	$\csc u$	$\log \sin u$	$\log \cos u$	$\log \tan u$	u

Circular Functions.

u	sin u	= F'	cos u	= F'	log sin u	= F'	log cos u	= F'	z
1.400	0.88545	17.0	0.16907	98.5	0.00353	7.5	0.23036	251.8	80 12 30.73
.401	0.88562	16.0	0.16898	98.6	0.00371	7.4	0.22784	253.3	80 15 10.59
.402	0.88579	15.8	0.16890	98.6	0.00378	7.4	0.22530	254.8	80 19 43.20
.403	0.88596	15.7	0.16791	98.6	0.00386	7.4	0.22274	256.4	80 23 09.52
.404	0.88612	15.6	0.16691	98.6	0.00393	7.3	0.22017	258.0	80 26 35.79
1.405	0.88629	15.5	0.16594	98.6	0.00400	7.3	0.21758	259.5	80 30 02.05
.406	0.88645	15.4	0.16495	98.6	0.00408	7.2	0.21498	261.1	80 33 28.32
.407	0.88662	15.3	0.16396	98.7	0.00415	7.2	0.21236	262.8	80 36 54.58
.408	0.88678	15.2	0.16298	98.7	0.00422	7.1	0.20972	264.4	80 40 20.83
.409	0.88694	15.1	0.16199	98.7	0.00429	7.1	0.20707	266.1	80 43 47.11
1.410	0.88710	15.0	0.16100	98.7	0.00436	7.0	0.20440	267.8	80 47 13.38
.411	0.88726	14.9	0.15998	98.7	0.00443	7.0	0.20172	269.5	80 50 39.64
.412	0.88742	14.8	0.15893	98.7	0.00450	7.0	0.19901	271.3	80 54 05.91
.413	0.88758	14.7	0.15784	98.8	0.00457	6.9	0.19628	272.0	80 57 32.17
.414	0.88773	14.6	0.15683	98.8	0.00464	6.9	0.19353	274.7	80 00 58.44
1.415	0.88789	14.5	0.15587	98.8	0.00471	6.8	0.19080	276.5	80 04 24.70
.416	0.88804	14.4	0.15488	98.8	0.00478	6.8	0.18802	278.3	80 07 50.97
.417	0.88820	14.3	0.15389	98.8	0.00484	6.7	0.18523	280.2	80 11 17.23
.418	0.88835	14.2	0.15288	98.8	0.00491	6.7	0.18244	282.0	80 14 43.50
.419	0.88850	14.1	0.15181	98.9	0.00498	6.6	0.17969	283.0	80 18 09.76
1.420	0.88865	14.0	0.15083	98.9	0.00504	6.6	0.17691	284.8	80 21 36.02
.421	0.88880	14.0	0.14984	98.9	0.00511	6.6	0.17418	286.8	80 25 02.28
.422	0.88895	14.0	0.14885	98.9	0.00517	6.5	0.17140	288.7	80 28 28.55
.423	0.88910	14.0	0.14785	98.9	0.00524	6.5	0.16868	291.7	80 31 54.82
.424	0.88924	14.0	0.14687	98.9	0.00530	6.4	0.16595	293.7	80 35 21.08
1.425	0.88939	14.5	0.14588	98.9	0.00537	6.4	0.16321	295.8	80 38 47.35
.426	0.88954	14.4	0.14489	99.0	0.00543	6.3	0.16048	297.8	80 42 13.61
.427	0.88968	14.3	0.14390	99.0	0.00549	6.3	0.15775	299.9	80 45 39.88
.428	0.88983	14.2	0.14291	99.0	0.00555	6.2	0.15502	302.1	80 49 06.14
.429	0.88996	14.1	0.14192	99.0	0.00562	6.2	0.15228	304.2	80 52 32.41
1.430	0.89010	14.0	0.14093	99.0	0.00568	6.2	0.14956	306.4	80 55 58.67
.431	0.89024	13.9	0.13994	99.0	0.00574	6.1	0.14683	308.6	80 59 24.94
.432	0.89038	13.8	0.13895	99.0	0.00580	6.1	0.14408	310.9	80 02 51.20
.433	0.89052	13.7	0.13796	99.1	0.00586	6.0	0.14135	313.2	80 06 17.47
.434	0.89066	13.6	0.13697	99.1	0.00592	6.0	0.13862	315.5	80 09 43.73
1.435	0.89079	13.5	0.13598	99.1	0.00598	5.9	0.13589	317.8	80 13 10.00
.436	0.89093	13.4	0.13499	99.1	0.00604	5.9	0.13316	320.2	80 16 36.26
.437	0.89106	13.3	0.13400	99.1	0.00610	5.8	0.13043	322.7	80 20 02.53
.438	0.89120	13.2	0.13301	99.1	0.00616	5.8	0.12770	325.1	80 23 28.79
.439	0.89133	13.1	0.13202	99.1	0.00622	5.8	0.12497	327.6	80 26 55.06
1.440	0.89146	13.0	0.13103	99.1	0.00627	5.7	0.12224	330.1	80 30 21.32
.441	0.89159	12.9	0.13004	99.2	0.00633	5.7	0.11951	332.7	80 33 47.59
.442	0.89172	12.8	0.12905	99.2	0.00639	5.6	0.11678	335.3	80 37 13.85
.443	0.89185	12.7	0.12806	99.2	0.00644	5.6	0.11405	338.0	80 40 40.12
.444	0.89197	12.6	0.12707	99.2	0.00650	5.5	0.11132	340.7	80 44 06.38
1.445	0.89210	12.5	0.12608	99.2	0.00655	5.5	0.10859	343.4	80 47 32.65
.446	0.89222	12.4	0.12509	99.2	0.00661	5.4	0.10586	346.2	80 50 58.91
.447	0.89235	12.3	0.12410	99.2	0.00666	5.4	0.10313	349.0	80 54 25.17
.448	0.89247	12.2	0.12311	99.2	0.00672	5.4	0.10040	351.9	80 57 51.44
.449	0.89259	12.1	0.12212	99.3	0.00677	5.3	0.09767	354.8	80 01 17.70
1.450	0.89271	12.1	0.12099	99.3	0.00682	5.3	0.09494	357.8	80 04 43.97
u	= 1 sin u	= F'	cos u	= F'	log sin u	= F'	log cos u	= F'	u

Circular Functions.

u	$\sin u$	$\cos u$	$\tan u$	$\cot u$	$\sec u$	$\csc u$	$\log \sin u$	$\log \cos u$	$\log \tan u$	u
1.450	0.99271	12.1	0.12050	90.3	9.06682	5.3	9.08100	357.8	83 04 43.07	
1.451	0.99283	12.0	0.11951	90.3	9.06688	5.2	9.07740	358.8	83 08 10.23	
1.452	0.99295	11.9	0.11852	90.3	9.06693	5.2	9.07378	359.9	83 11 36.90	
1.453	0.99307	11.8	0.11752	90.3	9.06698	5.1	9.07013	360.0	83 15 02.76	
1.454	0.99319	11.7	0.11653	90.3	9.06703	5.1	9.06644	370.1	83 18 29.03	
1.455	0.99330	11.6	0.11554	90.3	9.06708	5.1	9.06279	373.4	83 21 55.20	
1.456	0.99342	11.5	0.11454	90.3	9.06713	5.0	9.05917	376.7	83 25 21.50	
1.457	0.99353	11.4	0.11355	90.4	9.06718	5.0	9.05551	380.0	83 28 47.82	
1.458	0.99365	11.3	0.11256	90.4	9.06723	4.9	9.05187	383.4	83 32 14.00	
1.459	0.99376	11.2	0.11156	90.4	9.06728	4.9	9.04822	386.8	83 35 40.35	
1.460	0.99387	11.1	0.11057	90.4	9.06733	4.8	9.04454	390.4	83 39 06.52	
1.461	0.99398	11.0	0.10958	90.4	9.06738	4.8	9.04087	394.0	83 42 32.88	
1.462	0.99409	10.9	0.10858	90.4	9.06744	4.7	9.03720	397.6	83 45 59.15	
1.463	0.99420	10.8	0.10759	90.4	9.06749	4.7	9.03352	401.3	83 49 25.41	
1.464	0.99430	10.7	0.10659	90.4	9.06754	4.7	9.02985	405.1	83 52 51.68	
1.465	0.99441	10.6	0.10560	90.4	9.06759	4.6	9.02616	409.0	83 56 17.94	
1.466	0.99451	10.5	0.10460	90.5	9.06764	4.6	9.02248	412.0	83 59 44.21	
1.467	0.99462	10.4	0.10361	90.5	9.06769	4.5	9.01879	416.0	84 03 10.47	
1.468	0.99472	10.3	0.10261	90.5	9.06774	4.5	9.01511	420.1	84 06 36.74	
1.469	0.99482	10.2	0.10162	90.5	9.06779	4.4	9.01142	425.2	84 10 03.00	
1.470	0.99492	10.1	0.10063	90.5	9.06784	4.4	9.00773	430.4	84 13 29.27	
1.471	0.99502	10.0	0.09963	90.5	9.06789	4.3	9.00404	435.7	84 16 55.53	
1.472	0.99512	9.9	0.09864	90.5	9.06794	4.3	9.00035	441.0	84 20 21.79	
1.473	0.99522	9.8	0.09764	90.5	9.06799	4.3	9.00035	446.7	84 23 48.06	
1.474	0.99532	9.7	0.09665	90.5	9.06804	4.2	9.00035	452.3	84 27 14.32	
1.475	0.99542	9.6	0.09565	90.5	9.06809	4.2	8.99666	458.0	84 30 40.59	
1.476	0.99551	9.5	0.09466	90.6	9.06814	4.1	8.99297	463.7	84 34 06.85	
1.477	0.99560	9.4	0.09366	90.6	9.06819	4.1	8.98928	469.4	84 37 33.12	
1.478	0.99570	9.3	0.09266	90.6	9.06824	4.0	8.98559	475.1	84 40 59.38	
1.479	0.99579	9.2	0.09167	90.6	9.06829	4.0	8.98190	480.8	84 44 25.65	
1.480	0.99588	9.1	0.09067	90.6	9.06834	4.0	8.97821	486.5	84 47 51.91	
1.481	0.99597	9.0	0.08968	90.6	9.06839	3.9	8.97452	492.2	84 51 18.18	
1.482	0.99606	8.9	0.08868	90.6	9.06844	3.9	8.97083	497.9	84 54 44.44	
1.483	0.99615	8.8	0.08768	90.6	9.06849	3.8	8.96714	503.6	84 58 10.71	
1.484	0.99624	8.7	0.08669	90.6	9.06854	3.8	8.96345	509.3	85 01 36.97	
1.485	0.99633	8.6	0.08569	90.6	9.06859	3.7	8.95976	515.0	85 05 03.24	
1.486	0.99642	8.5	0.08469	90.6	9.06864	3.7	8.95607	520.7	85 08 29.50	
1.487	0.99651	8.4	0.08370	90.6	9.06869	3.6	8.95238	526.4	85 11 55.77	
1.488	0.99660	8.3	0.08270	90.7	9.06874	3.6	8.94869	532.1	85 15 22.03	
1.489	0.99669	8.2	0.08171	90.7	9.06879	3.6	8.94500	537.8	85 18 48.30	
1.490	0.99678	8.1	0.08071	90.7	9.06884	3.5	8.94131	543.5	85 22 14.56	
1.491	0.99687	8.0	0.07971	90.7	9.06889	3.5	8.93762	549.2	85 25 40.83	
1.492	0.99696	7.9	0.07871	90.7	9.06894	3.4	8.93393	554.9	85 29 07.09	
1.493	0.99705	7.8	0.07772	90.7	9.06899	3.4	8.93024	560.6	85 32 33.36	
1.494	0.99714	7.7	0.07672	90.7	9.06904	3.3	8.92655	566.3	85 35 59.62	
1.495	0.99723	7.6	0.07572	90.7	9.06909	3.3	8.92286	572.0	85 39 25.89	
1.496	0.99732	7.5	0.07473	90.7	9.06914	3.3	8.91917	577.7	85 42 52.15	
1.497	0.99741	7.4	0.07373	90.7	9.06919	3.2	8.91548	583.4	85 46 18.41	
1.498	0.99750	7.3	0.07273	90.7	9.06924	3.2	8.91179	589.1	85 49 44.68	
1.499	0.99759	7.2	0.07173	90.7	9.06929	3.1	8.90810	594.8	85 53 10.94	
1.500	0.99768	7.1	0.07074	90.7	9.06934	3.1	8.90441	600.5	85 56 37.21	
u	$-\sin u$	$\cos u$	$\tan u$	$\cot u$	$\sec u$	$\csc u$	$\log \sin u$	$\log \cos u$	$\log \tan u$	u

Circular Functions.

u	sin u	cos u	tan u	cot u	sec u	csc u	log sin u	log cos u	log tan u	u
1.500	0.99749	7.1	0.07074	99.7	9.99991	3.1	8.81965	612.4	85° 36' 37.21	
.501	0.99757	7.0	0.07074	99.8	9.99991	3.1	8.81965	612.4	86° 00' 03.47	
.502	0.99763	6.9	0.07074	99.8	9.99991	3.0	8.81965	612.4	86° 23' 29.74	
.503	0.99770	6.8	0.07074	99.8	9.99991	2.9	8.81965	612.4	86° 46' 56.00	
.504	0.99777	6.7	0.07074	99.8	9.99991	2.9	8.81965	612.4	87° 10' 22.27	
1.505	0.99784	6.6	0.07074	99.8	9.99991	2.8	8.81965	612.4	87° 33' 48.53	
.506	0.99790	6.5	0.07074	99.8	9.99991	2.8	8.81965	612.4	87° 57' 14.80	
.507	0.99797	6.4	0.07074	99.8	9.99991	2.7	8.81965	612.4	88° 20' 41.06	
.508	0.99803	6.3	0.07074	99.8	9.99991	2.7	8.81965	612.4	88° 44' 07.33	
.509	0.99809	6.2	0.07074	99.8	9.99991	2.7	8.81965	612.4	89° 07' 33.59	
1.510	0.99815	6.1	0.07074	99.8	9.99991	2.6	8.81965	612.4	89° 31' 59.86	
.511	0.99821	6.0	0.07074	99.8	9.99991	2.6	8.81965	612.4	89° 56' 26.12	
.512	0.99827	5.9	0.07074	99.8	9.99991	2.5	8.81965	612.4	90° 20' 52.39	
.513	0.99833	5.8	0.07074	99.8	9.99991	2.5	8.81965	612.4	90° 45' 18.65	
.514	0.99839	5.7	0.07074	99.8	9.99991	2.5	8.81965	612.4	91° 09' 44.92	
1.515	0.99844	5.6	0.07074	99.8	9.99991	2.4	8.81965	612.4	91° 34' 11.18	
.516	0.99850	5.5	0.07074	99.8	9.99991	2.4	8.81965	612.4	91° 58' 37.45	
.517	0.99856	5.4	0.07074	99.8	9.99991	2.3	8.81965	612.4	92° 23' 03.71	
.518	0.99861	5.3	0.07074	99.8	9.99991	2.3	8.81965	612.4	92° 47' 29.98	
.519	0.99866	5.2	0.07074	99.8	9.99991	2.3	8.81965	612.4	93° 11' 56.24	
1.520	0.99871	5.1	0.07074	99.8	9.99991	2.2	8.81965	612.4	93° 36' 22.51	
.521	0.99876	5.0	0.07074	99.8	9.99991	2.2	8.81965	612.4	94° 00' 48.77	
.522	0.99881	4.9	0.07074	99.8	9.99991	2.1	8.81965	612.4	94° 25' 15.04	
.523	0.99886	4.8	0.07074	99.8	9.99991	2.1	8.81965	612.4	94° 49' 41.30	
.524	0.99891	4.7	0.07074	99.8	9.99991	2.0	8.81965	612.4	95° 14' 07.56	
1.525	0.99895	4.6	0.07074	99.8	9.99991	2.0	8.81965	612.4	95° 38' 33.83	
.526	0.99900	4.5	0.07074	99.8	9.99991	1.9	8.81965	612.4	96° 03' 00.09	
.527	0.99904	4.4	0.07074	99.8	9.99991	1.9	8.81965	612.4	96° 27' 26.36	
.528	0.99908	4.3	0.07074	99.8	9.99991	1.8	8.81965	612.4	96° 51' 52.62	
.529	0.99913	4.2	0.07074	99.8	9.99991	1.8	8.81965	612.4	97° 16' 18.89	
1.530	0.99917	4.1	0.07074	99.8	9.99991	1.7	8.81965	612.4	97° 40' 45.15	
.531	0.99921	4.0	0.07074	99.8	9.99991	1.7	8.81965	612.4	98° 05' 11.42	
.532	0.99925	3.9	0.07074	99.8	9.99991	1.7	8.81965	612.4	98° 29' 37.68	
.533	0.99929	3.8	0.07074	99.8	9.99991	1.6	8.81965	612.4	98° 54' 03.95	
.534	0.99933	3.7	0.07074	99.8	9.99991	1.6	8.81965	612.4	99° 18' 30.21	
1.535	0.99936	3.6	0.07074	99.8	9.99991	1.5	8.81965	612.4	99° 42' 56.48	
.536	0.99940	3.5	0.07074	99.8	9.99991	1.5	8.81965	612.4	100° 07' 22.74	
.537	0.99943	3.4	0.07074	99.8	9.99991	1.5	8.81965	612.4	100° 31' 49.01	
.538	0.99946	3.3	0.07074	99.8	9.99991	1.4	8.81965	612.4	100° 56' 15.27	
.539	0.99949	3.2	0.07074	99.8	9.99991	1.4	8.81965	612.4	101° 20' 41.54	
1.540	0.99953	3.1	0.07074	100.0	9.99991	1.3	8.81965	612.4	101° 45' 07.80	
.541	0.99956	3.0	0.07074	100.0	9.99991	1.3	8.81965	612.4	102° 09' 34.07	
.542	0.99959	2.9	0.07074	100.0	9.99991	1.3	8.81965	612.4	102° 34' 00.33	
.543	0.99961	2.8	0.07074	100.0	9.99991	1.2	8.81965	612.4	102° 58' 26.60	
.544	0.99964	2.7	0.07074	100.0	9.99991	1.2	8.81965	612.4	103° 22' 52.86	
1.545	0.99967	2.6	0.07074	100.0	9.99991	1.1	8.81965	612.4	103° 47' 19.13	
.546	0.99969	2.5	0.07074	100.0	9.99991	1.1	8.81965	612.4	104° 11' 45.40	
.547	0.99972	2.4	0.07074	100.0	9.99991	1.0	8.81965	612.4	104° 36' 11.66	
.548	0.99974	2.3	0.07074	100.0	9.99991	1.0	8.81965	612.4	105° 00' 37.93	
.549	0.99976	2.2	0.07074	100.0	9.99991	0.9	8.81965	612.4	105° 25' 04.19	
1.550	0.99978	2.1	0.07074	100.0	9.99991	0.8	8.81965	612.4	105° 49' 30.45	
u	-sin u	cos u	tan u	cot u	sec u	csc u	log sin u	log cos u	log tan u	u

Circular Functions.

x	$\sin x$	$= F_1'$	$\cos x$	$= F_2'$	$\log \sin x$	$= F_3'$	$\log \cos x$	$= F_4'$	θ
1.550	0.999988	4.1	0.000012	10000	0.000001	0.0	8.31296	2088.0	88° 48' 36.45
.551	0.999989	4.0	0.000011		0.000001	0.0	2090.0	2103.5	88 51 36.71
.552	0.999989	3.9	0.000011		0.000001	0.0	2092.0	2119.1	88 54 36.97
.553	0.999989	3.8	0.000010		0.000001	0.0	2094.0	2134.7	88 57 37.23
.554	0.999989	3.7	0.000010		0.000001	0.0	2096.0	2150.3	89 00 37.49
1.555	0.999988	3.6	0.000010	10000	0.000001	0.0	8.16851	2700.1	89 03 37.75
.556	0.999988	3.5	0.000010		0.000001	0.0	1700.1	2724.2	89 06 38.01
.557	0.999988	3.4	0.000010		0.000001	0.0	1.8075	3147.7	89 12 38.27
.558	0.999988	3.3	0.000010		0.000001	0.0	3.0707	3393.7	89 16 38.53
.559	0.999988	3.2	0.000010		0.000001	0.0	0.7174	3681.1	89 19 38.79
1.560	0.999987	3.1	0.000010	10000	0.000001	0.0	8.03322	4024.5	89 22 39.05
.561	0.999987	3.0	0.000010		0.000001	0.0	7.99100	4433.1	89 26 39.31
.562	0.999987	2.9	0.000010		0.000001	0.0	0.1130	0.017	89 29 39.57
.563	0.999987	2.8	0.000010		0.000001	0.0	0.0189	3570.1	89 33 39.83
.564	0.999987	2.7	0.000010		0.000001	0.0	0.1227	0.0000	89 36 39.89
1.565	0.999986	2.6	0.000010	10000	0.000001	0.0	7.76115	7402.5	89 40 40.15
.566	0.999986	2.5	0.000010		0.000000	0.0	0.0000	0.0000	89 43 40.41
.567	0.999986	2.4	0.000010		0.000000	0.0	0.0000	0.0000	89 46 40.67
.568	0.999986	2.3	0.000010		0.000000	0.0	0.0000	0.0000	89 49 40.93
.569	0.999986	2.2	0.000010		0.000000	0.0	0.0000	0.0000	89 52 41.19
1.570	0.999985	2.1	0.000010	10000	0.000000	0.0	6.00100	51517.4	89 57 15.75
.571	0.999985	2.0	0.000010		0.000000	0.0	6.98994	213228.5	90 00 42.01
.572	0.999985	1.9	0.000010		0.000000	0.0	7.00000	30000.0	90 01 08.27
.573	0.999985	1.8	0.000010		0.000000	0.0	7.13115	0.0000	90 07 34.53
.574	0.999985	1.7	0.000010		0.000000	0.0	0.0000	0.0000	90 11 00.79
1.575	0.999984	1.6	0.000010	10000	0.000000	0.0	7.62313	8031.2	90 14 27.07
.576	0.999984	1.5	0.000010		0.000000	0.0	7.70000	8115.3	90 17 53.33
.577	0.999984	1.4	0.000010		0.000000	0.0	7.81215	7000.5	90 21 09.60
.578	0.999984	1.3	0.000010		0.000000	0.0	7.87555	6148.0	90 24 45.86
.579	0.999984	1.2	0.000010		0.000000	0.0	0.0000	5000.0	90 28 12.13
1.580	0.999983	1.1	0.000010	10000	0.000000	0.0	7.00000	4718.6	90 31 38.39
.581	0.999983	1.0	0.000010		0.000000	0.0	8.00000	4290.1	90 35 04.66
.582	0.999983	0.9	0.000010		0.000000	0.0	0.0000	3876.2	90 38 30.92
.583	0.999983	0.8	0.000010		0.000000	0.0	0.0000	3500.0	90 41 57.19
.584	0.999983	0.7	0.000010		0.000000	0.0	0.0000	3200.0	90 45 23.45
1.585	0.999982	0.6	0.000010	10000	0.000000	0.0	8.15230	3052.4	90 48 49.72
.586	0.999982	0.5	0.000010		0.000000	0.0	0.0000	2800.1	90 52 15.98
.587	0.999982	0.4	0.000010		0.000000	0.0	0.0000	2500.0	90 55 42.25
.588	0.999982	0.3	0.000010		0.000000	0.0	0.0000	2200.0	90 59 08.51
.589	0.999982	0.2	0.000010		0.000000	0.0	0.0000	2000.0	91 02 34.78
1.590	0.999981	0.1	0.000010	10000	0.000000	0.0	8.28376	2261.2	91 06 01.04
.591	0.999981	0.0	0.000010		0.000000	0.0	0.0000	2000.0	91 09 27.31
.592	0.999981	0.0	0.000010		0.000000	0.0	0.0000	1800.0	91 12 53.57
.593	0.999981	0.0	0.000010		0.000000	0.0	0.0000	1600.0	91 16 19.84
.594	0.999981	0.0	0.000010		0.000000	0.0	0.0000	1400.0	91 19 46.10
1.595	0.999980	0.0	0.000010	10000	0.000000	0.0	8.38884	1700.0	91 23 12.37
.596	0.999980	0.0	0.000010		0.000000	0.0	0.0000	1500.0	91 26 38.63
.597	0.999980	0.0	0.000010		0.000000	0.0	0.0000	1300.0	91 30 04.90
.598	0.999980	0.0	0.000010		0.000000	0.0	0.0000	1100.0	91 33 31.16
.599	0.999980	0.0	0.000010		0.000000	0.0	0.0000	1000.0	91 36 57.43
1.600	0.999979	0.0	0.000010	10000	0.000000	0.0	8.46638	1485.7	91 40 23.69
θ	$-\frac{1}{2} \sin 2\theta$	$= F_1'$	$\cos 2\theta$	$= F_2'$	$\log \frac{\sin \theta}{1}$	$= F_3'$	$\log \cos \theta$	$= F_4'$	θ

Circular Functions.

u	$\sin u$	$\cos u$	$\log \sin u$	$\log \cos u$	π
0.0	+0.00000 00000	+1.00000 00000	— 00	0.00000	00 00' 00.00000 00
.1	.00983 34166	0.99500 41053	8.09928	0.09782	05 43 40.68662 47
.2	.01961 68308	0.98000 65778	0.99813	0.09126	11 27 32.06124 04
.3	.02943 00077	0.95531 64801	0.47099	0.08460	17 11 19.41187 61
.4	.03921 83423	0.92100 09940	0.59242	0.07640	22 55 05.07349 88
0.5	+0.47942 55386	+0.87758 25610	0.08072	0.04320	28 38 52.60312 35
.6	.50404 24734	.85333 56140	0.75177	0.01663	34 20 38.88734 83
.7	.64421 76872	.76484 24873	0.80903	0.81357	40 00 25.16477 30
.8	.71735 60909	.67970 67093	0.85573	0.84305	45 50 11.84099 77
.9	.78332 69096	.62160 99683	0.89394	0.79182	51 33 58.32502 24
1.0	+0.84147 09648	+0.54030 23009	0.01504	0.73264	57 17 44.20224 71
.1	.89120 73601	.45350 61214	0.94998	0.65657	63 01 31.28887 18
.2	.93203 90860	.38235 77565	0.46943	0.55914	68 45 17.70749 05
.3	.96355 81854	.26740 88280	0.08188	0.42732	74 29 04.24812 11
.4	.98544 97160	.16996 71450	0.09363	0.32093	80 12 43.72874 50
1.5	+0.99740 49866	+0.07073 78017	0.90892	8.24065	85 56 37.20037 06
.6	.99937 36030	— .00010 95223	0.90984	8.46536	91 40 13.08090 54
.7	.99996 48105	— .00004 44943	0.90996	9.11007	97 24 10.17062 08
.8	.99999 76309	— .00000 30947	0.90999	9.39041	103 07 56.64124 48
.9	.99999 99877	— .00000 00123	0.90999	9.90950	108 51 43.13280 05
2.0	+0.90929 74268	—0.41614 68265	0.95877	0.61015	114 35 20.61249 42
.1	.86120 03666	—0.48434 61040	0.93012	0.70310	120 19 16.09311 89
.2	.80849 64078	—0.58840 11173	0.90768	0.76075	126 03 00.57374 16
.3	.74570 52112	—0.66277 60215	0.87357	0.82305	131 40 49.05420 83
.4	.67546 31866	—0.73739 37155	0.82960	0.86770	137 30 35.53499 30
2.5	+0.50847 21441	—0.86134 16155	0.77704	0.90371	143 16 21.61561 77
.6	.51550 12718	—0.85688 87534	0.71223	0.93202	148 58 08.40614 34
.7	.47337 93802	—0.90467 21420	0.53601	0.95600	154 41 50.07680 72
.8	.33498 81802	—0.46722 23407	0.55203	0.97415	160 25 47.45740 19
.9	.23934 93902	—0.90999 24066	0.27885	0.98720	166 09 27.93811 06
3.0	+0.14113 00081	—0.98999 51503	0.14059	0.99563	171 53 16.41876 13
.1	— .04158 66024	0.99113 51503	8.61880	0.99960	177 37 00.89936 80
.2	— .05837 41434	0.98209 47758	8.76622	0.99916	183 20 47.37099 07
.3	— .07774 59041	0.96147 97600	9.10795	0.99453	189 04 33.86061 54
.4	— .09554 11020	0.96670 81920	9.40746	0.98536	194 48 04.34744 62
3.5	—0.35078 22277	—0.93645 66873	0.34504	0.97140	200 32 06.82286 48
.6	—0.42521 04433	—0.80715 84263	0.04503	0.95688	206 15 53.30148 95
.7	—0.50813 01400	—0.61810 00317	0.72414	0.93845	211 59 36.78311 43
.8	—0.58185 78909	—0.39095 77119	0.38655	0.91810	217 43 26.36371 37
.9	—0.64776 61992	—0.13593 23042	0.83344	0.88690	223 27 13.74430 00
4.0	—0.75680 24953	—0.65564 36809	0.87808	0.81534	229 10 59.22498 84
.1	—0.81827 71111	—0.57432 39465	0.92200	0.72953	234 54 45.70901 31
.2	—0.87157 57724	—0.49086 08913	0.94013	0.66043	240 38 32.18023 57
.3	—0.91616 59367	—0.40099 91791	0.95607	0.60393	246 22 22.61686 25
.4	—0.95160 30719	—0.30733 25700	0.97840	0.48761	252 06 05.14748 72
4.5	—0.97753 01377	—0.21079 57904	0.99013	0.32386	257 40 51.66281 29
.6	—0.99389 10036	—0.11215 24202	0.99725	0.20481	263 33 38.10873 60
.7	—0.99922 33576	—0.01238 86635	0.99997	0.09002	269 17 24.58936 14
.8	—0.99916 46088	+0.89249 89344	0.99953	8.04100	275 01 11.00968 01
.9	—0.98245 26116	—0.18651 25694	0.99937	9.27072	280 44 37.52601 68
5.0	—0.95952 42747	+0.28360 21855	0.99817	9.45280	286 28 44.03123 55
u	— 1 strk in	cosh $3u$	$\log \frac{\sinh u}{u}$	$\log \cosh u$	π

Circular Functions.

x	$\sin x$	$\cos x$	$\log \sin x$	$\log \cos x$	π
5.0	0.995882 42747	0.089166 21845	0.981784	0.45280	286° 28' 44.03123 55
.1	0.995881 41653	0.089167 21847	0.981652	0.452747	292 12 35.51186 02
.2	0.995879 40557	0.089168 21848	0.981514	0.452703	297 36 16.09248 49
.3	0.995876 39452	0.089169 21849	0.981376	0.452659	303 40 02.47210 06
.4	0.995872 38347	0.089170 21850	0.981238	0.452615	309 31 40.05213 43
5.5	0.995854 37256	0.089166 21851	0.981094	0.452571	315 07 36.43433 90
.6	0.995836 36170	0.089167 21852	0.980952	0.452527	320 51 22.01498 37
.7	0.995818 35086	0.089168 21853	0.980810	0.452483	326 35 09.39563 84
.8	0.995799 34001	0.089169 21854	0.980668	0.452439	332 18 55.87623 32
.9	0.995780 32918	0.089170 21855	0.980526	0.452395	338 02 42.35685 79
6.0	0.995741 31834	0.089166 21856	0.980384	0.452351	343 46 28.83748 26
.1	0.995722 30751	0.089167 21857	0.980242	0.452307	349 30 15.31810 73
.2	0.995703 29668	0.089168 21858	0.980100	0.452263	355 14 01.79873 20
.3	0.995684 28585	0.089169 21859	0.980000	0.452219	360 57 48.27935 67
.4	0.995665 27502	0.089170 21860	0.979899	0.452175	366 41 34.75998 14
6.5	0.995626 26418	0.089166 21861	0.979757	0.452131	372 25 21.24060 61
.6	0.995607 25335	0.089167 21862	0.979615	0.452087	378 09 07.72123 08
.7	0.995588 24252	0.089168 21863	0.979473	0.452043	383 52 54.20185 55
.8	0.995569 23169	0.089169 21864	0.979331	0.451999	389 36 40.68248 03
.9	0.995550 22086	0.089170 21865	0.979189	0.451955	395 20 27.16310 50
7.0	0.995511 21002	0.089166 21866	0.979047	0.451911	401 04 13.64372 97
.1	0.995492 20000	0.089167 21867	0.978905	0.451867	406 48 00.12435 44
.2	0.995473 19000	0.089168 21868	0.978763	0.451823	412 31 46.60497 91
.3	0.995454 18000	0.089169 21869	0.978621	0.451779	418 15 32.08560 38
.4	0.995435 17000	0.089170 21870	0.978479	0.451735	423 59 19.56622 85
7.5	0.995396 15916	0.089166 21871	0.978337	0.451691	429 43 06.04685 32
.6	0.995377 14916	0.089167 21872	0.978195	0.451647	435 26 52.52747 79
.7	0.995358 13916	0.089168 21873	0.978053	0.451603	441 10 39.00810 26
.8	0.995339 12916	0.089169 21874	0.977911	0.451559	446 54 25.48872 73
.9	0.995320 11916	0.089170 21875	0.977769	0.451515	452 38 11.96935 21
8.0	0.995281 10832	0.089166 21876	0.977627	0.451471	458 22 0.44997 68
.1	0.995262 9832	0.089167 21877	0.977485	0.451427	464 05 46.93060 15
.2	0.995243 8832	0.089168 21878	0.977343	0.451383	469 49 33.41122 62
.3	0.995224 7832	0.089169 21879	0.977201	0.451339	475 33 19.89185 09
.4	0.995205 6832	0.089170 21880	0.977059	0.451295	481 17 06.37247 56
8.5	0.995166 5732	0.089166 21881	0.976917	0.451251	487 00 52.85310 03
.6	0.995147 4732	0.089167 21882	0.976775	0.451207	492 44 37.33372 50
.7	0.995128 3732	0.089168 21883	0.976633	0.451163	498 28 22.81434 97
.8	0.995109 2732	0.089169 21884	0.976491	0.451119	504 12 08.29497 44
.9	0.995090 1732	0.089170 21885	0.976349	0.451075	509 55 53.77559 92
9.0	0.995051 16248	0.089166 21886	0.976207	0.451031	515 39 40.25622 39
.1	0.995032 15248	0.089167 21887	0.976065	0.450987	521 23 26.73684 86
.2	0.995013 14248	0.089168 21888	0.975923	0.450943	527 07 13.21747 33
.3	0.994994 13248	0.089169 21889	0.975781	0.450899	532 51 00.69809 80
.4	0.994975 12248	0.089170 21890	0.975639	0.450855	538 35 47.17871 27
9.5	0.994936 11164	0.089166 21891	0.975497	0.450811	544 18 35.65934 74
.6	0.994917 10164	0.089167 21892	0.975355	0.450767	550 02 22.13997 21
.7	0.994898 9164	0.089168 21893	0.975213	0.450723	555 46 08.62059 68
.8	0.994879 8164	0.089169 21894	0.975071	0.450679	561 30 55.10121 15
.9	0.994860 7164	0.089170 21895	0.974929	0.450635	567 14 41.58184 63
10.0	0.994821 6064	0.089166 21896	0.974787	0.450591	572 57 28.06247 10
x	$-\sin x$	$-\cos x$	$\log \sin x$	$\log \cos x$	π

SMITHSONIAN TABLES.

Circular Functions.

x	$\sin x$	$\cos x$	$\log \sin x$	$\log \cos x$	x
0	0.00000 00000	1.00000 00000	— 00	0.00000	00 00 00.00000 00
1	+ .84147 09848	+ 0.54039 71059	9.92504	9.73264	57 17 44.80524 71
2	+ .90930 74268	+ .41614 68365	9.95287	9.61955	114 35 29.61269 42
3	+ .14111 00081	+ .98999 24996	9.14959	9.99563	171 55 14.48743 53
4	+ .75680 24653	+ .65364 36939	9.87898	9.81534	229 30 59.22498 84
5	— 0.95901 42747	+ 0.28366 21855	9.98178	9.45180	286 28 44.01213 55
6	+ .17941 54082	+ .98017 08867	9.44625	9.08235	343 40 28.83748 26
7	+ .85508 65987	+ .75300 22543	9.81736	9.87732	401 04 13.44372 07
8	+ .98035 82466	+ .14550 00319	9.99531	9.16865	458 21 58.44893 68
9	+ .14111 84852	+ .98999 08199	9.14959	9.99558	515 39 43.25022 39
10	— 0.54039 71059	+ 0.83907 15191	9.73264	9.92580	572 57 28.06247 10
11	+ .90930 74268	+ .41614 68365	9.95287	9.61955	630 15 12.86871 81
12	+ .14111 84852	+ .98999 08199	9.14959	9.99558	687 33 57.67466 51
13	+ .75680 24653	+ .65364 36939	9.87898	9.81534	744 30 59.22498 84
14	+ .95901 42747	+ 0.28366 21855	9.98178	9.45180	802 28 44.01213 55
15	+ .17941 54082	+ .98017 08867	9.44625	9.08235	859 40 28.83748 26
16	+ .85508 65987	+ .75300 22543	9.81736	9.87732	917 04 13.44372 07
17	+ .98035 82466	+ .14550 00319	9.99531	9.16865	974 21 58.44893 68
18	+ .14111 84852	+ .98999 08199	9.14959	9.99558	1031 39 43.25022 39
19	— 0.54039 71059	+ 0.83907 15191	9.73264	9.92580	1088 57 28.06247 10
20	+ .90930 74268	+ .41614 68365	9.95287	9.61955	1146 15 12.86871 81
21	+ .14111 84852	+ .98999 08199	9.14959	9.99558	1203 33 57.67466 51
22	+ .75680 24653	+ .65364 36939	9.87898	9.81534	1260 30 59.22498 84
23	+ .95901 42747	+ 0.28366 21855	9.98178	9.45180	1317 40 28.83748 26
24	+ .17941 54082	+ .98017 08867	9.44625	9.08235	1374 40 13.44372 07
25	+ .85508 65987	+ .75300 22543	9.81736	9.87732	1431 21 58.44893 68
26	+ .98035 82466	+ .14550 00319	9.99531	9.16865	1488 39 43.25022 39
27	+ .14111 84852	+ .98999 08199	9.14959	9.99558	1545 57 28.06247 10
28	— 0.54039 71059	+ 0.83907 15191	9.73264	9.92580	1603 15 12.86871 81
29	+ .90930 74268	+ .41614 68365	9.95287	9.61955	1660 33 57.67466 51
30	+ .14111 84852	+ .98999 08199	9.14959	9.99558	1717 30 59.22498 84
31	+ .75680 24653	+ .65364 36939	9.87898	9.81534	1774 30 59.22498 84
32	+ .95901 42747	+ 0.28366 21855	9.98178	9.45180	1831 40 28.83748 26
33	+ .17941 54082	+ .98017 08867	9.44625	9.08235	1888 40 13.44372 07
34	+ .85508 65987	+ .75300 22543	9.81736	9.87732	1945 21 58.44893 68
35	+ .98035 82466	+ .14550 00319	9.99531	9.16865	2002 39 43.25022 39
36	+ .14111 84852	+ .98999 08199	9.14959	9.99558	2059 57 28.06247 10
37	— 0.54039 71059	+ 0.83907 15191	9.73264	9.92580	2116 15 12.86871 81
38	+ .90930 74268	+ .41614 68365	9.95287	9.61955	2173 33 57.67466 51
39	+ .14111 84852	+ .98999 08199	9.14959	9.99558	2230 30 59.22498 84
40	+ .75680 24653	+ .65364 36939	9.87898	9.81534	2287 30 59.22498 84
41	+ .95901 42747	+ 0.28366 21855	9.98178	9.45180	2344 40 28.83748 26
42	+ .17941 54082	+ .98017 08867	9.44625	9.08235	2401 40 13.44372 07
43	+ .85508 65987	+ .75300 22543	9.81736	9.87732	2458 21 58.44893 68
44	+ .98035 82466	+ .14550 00319	9.99531	9.16865	2515 39 43.25022 39
45	+ .14111 84852	+ .98999 08199	9.14959	9.99558	2572 57 28.06247 10
46	— 0.54039 71059	+ 0.83907 15191	9.73264	9.92580	2629 15 12.86871 81
47	+ .90930 74268	+ .41614 68365	9.95287	9.61955	2686 33 57.67466 51
48	+ .14111 84852	+ .98999 08199	9.14959	9.99558	2743 30 59.22498 84
49	+ .75680 24653	+ .65364 36939	9.87898	9.81534	2800 30 59.22498 84
50	+ .95901 42747	+ 0.28366 21855	9.98178	9.45180	2857 40 28.83748 26
51	+ .17941 54082	+ .98017 08867	9.44625	9.08235	2914 40 13.44372 07
52	+ .85508 65987	+ .75300 22543	9.81736	9.87732	2971 21 58.44893 68
53	+ .98035 82466	+ .14550 00319	9.99531	9.16865	3028 39 43.25022 39
54	+ .14111 84852	+ .98999 08199	9.14959	9.99558	3085 57 28.06247 10
55	— 0.54039 71059	+ 0.83907 15191	9.73264	9.92580	3142 15 12.86871 81
56	+ .90930 74268	+ .41614 68365	9.95287	9.61955	3199 33 57.67466 51
57	+ .14111 84852	+ .98999 08199	9.14959	9.99558	3256 30 59.22498 84
58	+ .75680 24653	+ .65364 36939	9.87898	9.81534	3313 30 59.22498 84
59	+ .95901 42747	+ 0.28366 21855	9.98178	9.45180	3370 40 28.83748 26
60	+ .17941 54082	+ .98017 08867	9.44625	9.08235	3427 40 13.44372 07
61	+ .85508 65987	+ .75300 22543	9.81736	9.87732	3484 21 58.44893 68
62	+ .98035 82466	+ .14550 00319	9.99531	9.16865	3541 39 43.25022 39
63	+ .14111 84852	+ .98999 08199	9.14959	9.99558	3598 57 28.06247 10
64	— 0.54039 71059	+ 0.83907 15191	9.73264	9.92580	3655 15 12.86871 81
65	+ .90930 74268	+ .41614 68365	9.95287	9.61955	3712 33 57.67466 51
66	+ .14111 84852	+ .98999 08199	9.14959	9.99558	3769 30 59.22498 84
67	+ .75680 24653	+ .65364 36939	9.87898	9.81534	3826 30 59.22498 84
68	+ .95901 42747	+ 0.28366 21855	9.98178	9.45180	3883 40 28.83748 26
69	+ .17941 54082	+ .98017 08867	9.44625	9.08235	3940 40 13.44372 07
70	+ .85508 65987	+ .75300 22543	9.81736	9.87732	3997 21 58.44893 68
71	+ .98035 82466	+ .14550 00319	9.99531	9.16865	4054 39 43.25022 39
72	+ .14111 84852	+ .98999 08199	9.14959	9.99558	4111 57 28.06247 10
73	— 0.54039 71059	+ 0.83907 15191	9.73264	9.92580	4168 15 12.86871 81
74	+ .90930 74268	+ .41614 68365	9.95287	9.61955	4225 33 57.67466 51
75	+ .14111 84852	+ .98999 08199	9.14959	9.99558	4282 30 59.22498 84
76	+ .75680 24653	+ .65364 36939	9.87898	9.81534	4339 30 59.22498 84
77	+ .95901 42747	+ 0.28366 21855	9.98178	9.45180	4396 40 28.83748 26
78	+ .17941 54082	+ .98017 08867	9.44625	9.08235	4453 40 13.44372 07
79	+ .85508 65987	+ .75300 22543	9.81736	9.87732	4510 21 58.44893 68
80	+ .98035 82466	+ .14550 00319	9.99531	9.16865	4567 39 43.25022 39
81	+ .14111 84852	+ .98999 08199	9.14959	9.99558	4624 57 28.06247 10
82	— 0.54039 71059	+ 0.83907 15191	9.73264	9.92580	4681 15 12.86871 81
83	+ .90930 74268	+ .41614 68365	9.95287	9.61955	4738 33 57.67466 51
84	+ .14111 84852	+ .98999 08199	9.14959	9.99558	4795 30 59.22498 84
85	+ .75680 24653	+ .65364 36939	9.87898	9.81534	4852 30 59.22498 84
86	+ .95901 42747	+ 0.28366 21855	9.98178	9.45180	4909 40 28.83748 26
87	+ .17941 54082	+ .98017 08867	9.44625	9.08235	4966 40 13.44372 07
88	+ .85508 65987	+ .75300 22543	9.81736	9.87732	5023 21 58.44893 68
89	+ .98035 82466	+ .14550 00319	9.99531	9.16865	5080 39 43.25022 39
90	+ .14111 84852	+ .98999 08199	9.14959	9.99558	5137 57 28.06247 10
91	— 0.54039 71059	+ 0.83907 15191	9.73264	9.92580	5194 15 12.86871 81
92	+ .90930 74268	+ .41614 68365	9.95287	9.61955	5251 33 57.67466 51
93	+ .14111 84852	+ .98999 08199	9.14959	9.99558	5308 30 59.22498 84
94	+ .75680 24653	+ .65364 36939	9.87898	9.81534	5365 30 59.22498 84
95	+ .95901 42747	+ 0.28366 21855	9.98178	9.45180	5422 40 28.83748 26
96	+ .17941 54082	+ .98017 08867	9.44625	9.08235	5479 40 13.44372 07
97	+ .85508 65987	+ .75300 22543	9.81736	9.87732	5536 21 58.44893 68
98	+ .98035 82466	+ .14550 00319	9.99531	9.16865	5593 39 43.25022 39
99	+ .14111 84852	+ .98999 08199	9.14959	9.99558	5650 57 28.06247 10
100	— 0.54039 71059	+ 0.83907 15191	9.73264	9.92580	5707 15 12.86871 81
101	+ .90930 74268	+ .41614 68365	9.95287	9.61955	5764 33 57.67466 51
102	+ .14111 84852	+ .98999 08199	9.14959	9.99558	5821 30 59.22498 84
103	+ .75680 24653	+ .65364 36939	9.87898	9.81534	5878 30 59.22498 84
104	+ .95901 42747	+ 0.28366 21855	9.98178	9.45180	5935 40 28.83748 26
105	+ .17941 54082	+ .98017 08867	9.44625	9.08235	5992 40 13.44372 07
106	+ .85508 65987	+ .75300 22543	9.81736	9.87732	6049 21 58.44893 68
107	+ .98035 82466	+ .14550 00319	9.99531	9.16865	6106 39 43.25022 39
108	+ .14111 84852	+ .98999 08199	9.14959	9.99558	6163 57 28.06247 10
109	— 0.54039 71059	+ 0.83907 15191	9.73264	9.92580	6220 15 12.86871 81
110	+ .90930 74268	+ .41614 68365	9.95287	9.61955	6277 33 57.67466 51
111	+ .14111 84852	+ .98999 08199	9.14959	9.99558	6334 30 59.22498 84
112	+ .75680 24653	+ .65364 36939	9.87898	9.81534	6391 30 59.22498 84
113	+ .95901 42747	+ 0.28366 21855	9.98178	9.45180	6448 40 28.83748 26
114	+ .17941 54082	+ .98017 08867	9.44625	9.08235	6505 40 13.44372 07
115	+ .85508 65987	+ .75300 22543	9.81736	9.87732	6562 21 58.44893 68
116	+ .98035 82466	+ .14550 00319	9.99531	9.16865	6619 39 43.25022 39
117	+ .14111 84852	+ .98999 08199	9.14959	9.99558	6676 57 28.06247 10
118	— 0.54039 71059	+ 0.83907 15191	9.73264	9.92580	6733 15 12.86871 81
119	+ .90930 74268	+ .41614 68365	9.95287	9.61955	6790 33 57.67466 51
120	+ .14111 84852	+ .98999 08199	9.14959	9.99558	6847 30 59.22498 84
121	+ .75680 24653	+ .65364 36939	9.87898	9.81534	6904 30 59.22498 84
122	+ .95901 42747	+ 0.28366 21855	9.98178	9.45180	6961 40 28.83748 26
123	+ .17941 54082	+ .98017 08867	9.44625	9.08235	7018 40 13.44372 07
124	+ .85508 65987	+ .75300 22543	9.81736	9.87732	7075 21 58.44893 68
125	+ .98035 82466	+ .14550 00319	9.99531	9.16865	7132 39 43.25022 39
126	+ .14111 84852	+ .98999 08199	9.14959	9.99558	7189 57 28.06247 10
127	— 0.54039 71059	+ 0.83907 15191	9.73264	9.92580	7246 15 12.86871

Circular Functions.

x	$\sin x$	$\cos x$	$\log \sin x$	$\log \cos x$	x
50	-.026217 48517	+ .026496 60285	0.41892	0.48451	864 47 30.31235 48
51	-.026032 51758	+.74255 41268	0.80222	0.87040	1921 05 05.11850 10
52	-.025846 55000	-.16209 97808	0.00415	0.21116	4070 21 49.02654 90
53	-.025659 58241	-.61828 27862	0.50701	0.96208	3030 40 34.71200 61
54	-.025473 61483	-.82030 96319	0.74725	0.91872	3093 58 10.52714 32
55	-.025287 64724	+ .020221 67963	0.90988	8.34407	3151 16 04.34359 03
56	-.025101 67965	+.85522 01077	0.71770	0.93106	3208 33 49.14081 74
57	-.024915 71206	+.89986 68270	0.61905	0.95418	3265 51 33.49208 45
58	-.024729 74447	+.11918 01354	0.09666	0.97620	3323 08 13.70333 16
59	-.024543 77687	-.77108 09230	0.80956	0.88710	3380 27 03.50857 87
60	-.024357 80928	-.05241 90804	0.48403	0.97883	3437 44 48.37482 58
61	-.024171 84169	-.25810 16350	0.90503	0.41170	3495 02 53.18107 29
62	-.023985 87410	+.07330 71023	0.86875	0.82834	3552 20 17.97832 00
63	-.023799 90651	+.98580 95810	0.22964	0.90325	3609 38 06.81430 71
64	-.023613 93892	+.39185 72304	0.96980	0.50315	3666 55 47.99081 42
65	+.023427 97133	-.05245 38512	0.91742	0.75900	3724 13 31.40606 13
66	+.023241 00374	-.99904 74500	8.42408	0.99985	3781 31 17.21230 84
67	+.023055 03615	-.51770 07008	0.93273	0.71414	3838 49 02.01855 55
68	+.022869 06856	+.44014 30225	0.95324	0.68239	3896 06 46.81430 26
69	+.022683 10097	+.90230 03797	0.99987	0.90712	3953 24 31.61204 07
70	+.022497 13338	+.06333 91031	0.88868	0.80102	4010 42 16.43720 67
71	+.022311 16579	-.30002 27282	0.97821	0.41890	4068 00 01.24354 38
72	+.022125 19820	-.90715 05883	0.40453	0.98554	4125 17 46.04070 09
73	+.021939 23061	-.73609 27182	0.89044	0.80690	4182 35 30.85603 80
74	+.021753 26302	+.77171 71418	0.90350	0.73481	4239 53 15.66228 51
75	+.021567 29543	+.06217 12607	0.95830	0.66461	4297 11 00.46853 22
76	+.021381 32784	+.82431 13311	0.75190	0.61010	4354 28 45.37477 03
77	+.021195 36025	-.03049 50317	0.90970	0.49101	4411 46 04.3008102 64
78	+.021009 39266	+.85130 30632	0.71004	0.93330	4469 04 14.88727 35
79	+.020823 42507	+.89597 09468	0.64740	0.95210	4526 22 59.60157 06
80	+.020637 45748	-.01103 72438	0.90734	0.84202	4583 39 44.40976 77
81	+.020451 48989	+.77608 50820	0.70086	0.80025	4640 57 30.30601 48
82	+.020265 52230	+.94667 76979	0.40586	0.97758	4698 15 14.11226 19
83	+.020079 55471	+.24654 01180	0.98604	0.39714	4755 32 58.01850 90
84	+.019893 58712	+.68002 34956	0.86582	0.83253	4812 50 43.72275 61
85	+.019707 61953	-.09843 66434	0.92570	0.69316	4870 08 28.53100 32
86	+.019521 65194	+.38369 84449	0.90542	0.58360	4927 26 13.33725 03
87	+.019335 68435	+.90075 03143	0.91476	0.75508	4984 44 58.14340 74
88	+.019149 71676	+.99937 32837	8.54898	0.49073	5042 02 42.04974 45
89	+.018963 74917	+.51017 70449	0.93453	0.70772	5099 20 27.75590 16
90	+.018777 78158	-.04480 36161	0.95134	0.65135	5156 37 12.36223 87
91	+.018591 81399	+.90430 74600	0.90525	0.49755	5213 55 57.36848 58
92	+.018405 84640	+.02044 44770	0.90120	0.70682	5271 12 42.17473 29
93	+.018219 87881	+.31724 87015	0.97604	0.50165	5328 30 20.01808 00
94	+.018033 91122	+.00045 03607	0.98601	0.48653	5385 48 14.78722 71
95	+.017847 94363	+.07301 73510	0.83459	0.86143	5443 05 36.39347 42
96	+.017661 97604	+.18043 04493	0.40281	0.95631	5500 23 41.39972 13
97	+.017475 00845	+.02514 75300	0.97934	0.96621	5557 41 26.20296 84
98	+.017289 04086	+.81018 82453	0.75844	0.91344	5614 59 11.01221 54
99	+.017103 07327	+.03082 08804	0.99960	8.60011	5672 16 55.81846 25
100	+.016917 10568	+.08023 18872	0.70441	0.93567	5729 34 40.04740 96
x	$-\sin x$	$\cos x$	$\log \frac{\sin x}{x}$	$\log \cos x$	x

SMITHSONIAN TABLES.

TABLE IV

THE ASCENDING AND DESCENDING EXPONENTIAL AND
 $\text{Log}_{10}(e^x)$

The Exponential.

x	$\log_{10}(e^x)$	e^x	e^{-x}	x	$\log_{10}(e^x)$	e^x	e^{-x}
0.000	0.000 0000	1.000 000	1.000 000	0.050	0.041 7147	1.051 271	0.951 2294
.001	.000 4343	.001 001	.000 999	.051	.042 1490	.052 323	.050 2787
.002	.000 8686	.002 002	.001 998	.052	.042 5833	.053 376	.049 1489
.003	.001 3029	.003 003	.002 997	.053	.043 0176	.054 430	.048 3800
.004	.001 7372	.004 004	.003 996	.054	.043 4519	.055 485	.047 4321
0.005	0.002 1715	1.005 011	0.995 0125	0.055	0.043 8862	1.056 541	0.946 4851
.006	.002 6058	.006 018	.994 0180	.056	.044 3205	.057 598	.945 5301
.007	.003 0401	.007 025	.993 0246	.057	.044 7548	.058 656	.944 5811
.008	.003 4744	.008 032	.992 0319	.058	.045 1891	.059 715	.943 6409
.009	.003 9087	.009 041	.991 0404	.059	.045 6234	.060 775	.942 7068
0.010	0.004 3429	1.010 050	0.990 0498	0.060	0.046 0577	1.061 837	0.941 7655
.011	.004 7772	.011 061	.989 0593	.061	.046 4920	.062 899	.940 8252
.012	.005 2115	.012 071	.988 0717	.062	.046 9263	.063 962	.939 8869
.013	.005 6458	.013 083	.987 0841	.063	.047 3606	.065 027	.938 9435
.014	.006 0801	.014 098	.986 0975	.064	.047 7949	.066 093	.938 0050
0.015	0.006 5144	1.015 113	0.985 1119	0.065	0.048 2391	1.067 159	0.937 0675
.016	.006 9487	.016 129	.984 1273	.066	.048 6834	.068 227	.936 1309
.017	.007 3830	.017 145	.983 1437	.067	.049 1277	.069 295	.935 1952
.018	.007 8173	.018 163	.982 1610	.068	.049 5720	.070 365	.934 2605
.019	.008 2516	.019 182	.981 1794	.069	.049 9663	.071 436	.933 3267
0.020	0.008 6859	1.020 201	0.980 1887	0.070	0.050 4006	1.072 508	0.932 3938
.021	.009 1202	.021 222	.979 2190	.071	.050 8349	.073 581	.931 4610
.022	.009 5545	.022 244	.978 2402	.072	.051 2692	.074 655	.930 5290
.023	.009 9888	.023 267	.977 2625	.073	.051 7035	.075 731	.929 5988
.024	.010 4231	.024 290	.976 2857	.074	.052 1378	.076 807	.928 6717
0.025	0.010 8574	1.025 315	0.975 3090	0.075	0.052 5721	1.077 884	0.927 7425
.026	.011 2917	.026 341	.974 3251	.076	.053 0064	.078 963	.926 8162
.027	.011 7260	.027 368	.973 3412	.077	.053 4407	.080 042	.925 8899
.028	.012 1602	.028 396	.972 3584	.078	.053 8750	.081 123	.924 9664
.029	.012 5945	.029 425	.971 3815	.079	.054 3093	.082 204	.924 0399
0.030	0.013 0288	1.030 455	0.970 4155	0.080	0.054 7436	1.083 287	0.923 1163
.031	.013 4631	.031 488	.969 4295	.081	.055 1779	.084 371	.922 1937
.032	.013 8974	.032 518	.968 5066	.082	.055 6122	.085 456	.921 2720
.033	.014 3317	.033 551	.967 5386	.083	.056 0465	.086 542	.920 3511
.034	.014 7660	.034 585	.966 5715	.084	.056 4807	.087 629	.919 4313
0.035	0.015 2003	1.035 620	0.965 6054	0.085	0.056 9150	1.088 717	0.918 5123
.036	.015 6346	.036 656	.964 6393	.086	.057 3493	.089 806	.917 5942
.037	.016 0689	.037 693	.963 6761	.087	.057 7836	.090 897	.916 6771
.038	.016 5032	.038 731	.962 7120	.088	.058 2179	.091 988	.915 7609
.039	.016 9375	.039 770	.961 7507	.089	.058 6522	.093 081	.914 8456
0.040	0.017 3718	1.040 811	0.960 7894	0.090	0.059 0865	1.094 174	0.913 9313
.041	.017 8061	.041 852	.959 8281	.091	.059 5208	.095 269	.913 0177
.042	.018 2404	.042 894	.958 8698	.092	.059 9551	.096 365	.912 1051
.043	.018 6747	.043 938	.957 9116	.093	.060 3894	.097 462	.911 1935
.044	.019 1090	.044 982	.956 9540	.094	.060 8237	.098 560	.910 2828
0.045	0.019 5433	1.045 028	0.955 9975	0.095	0.061 2580	1.099 659	0.909 3729
.046	.019 9775	.046 071	.955 0420	.096	.061 6923	.100 759	.908 4640
.047	.020 4118	.047 112	.954 0871	.097	.062 1266	.101 860	.907 5560
.048	.020 8461	.048 151	.953 1338	.098	.062 5609	.102 963	.906 6489
.049	.021 2804	.049 220	.952 1811	.099	.062 9952	.104 066	.905 7427
0.050	0.021 7147	1.051 271	0.951 2294	0.100	0.063 4294	1.105 171	0.904 8374
$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}	$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}

The Exponential.

x	$\log_{10}(e^x)$	e^x	e^{-x}	x	$\log_{10}(e^x)$	e^x	e^{-x}
0.100	0.043 4294	1.105 171	0.904 8374	0.130	0.065 1442	1.161 834	0.860 7080
0.101	0.043 8037	1.106 277	0.903 9330	0.131	0.065 5765	1.162 967	0.859 8477
0.102	0.044 2080	1.107 383	0.903 0296	0.132	0.066 0128	1.164 100	0.858 9883
0.103	0.044 7223	1.108 491	0.902 1270	0.133	0.066 4471	1.165 235	0.858 1297
0.104	0.045 1666	1.109 600	0.901 2253	0.134	0.066 8814	1.166 371	0.857 2720
0.105	0.045 6009	1.110 711	0.900 3245	0.135	0.067 3156	1.167 508	0.856 4152
0.106	0.046 0352	1.111 822	0.899 4236	0.136	0.067 7499	1.168 646	0.855 5592
0.107	0.046 4695	1.112 931	0.898 5232	0.137	0.068 1842	1.169 785	0.854 7031
0.108	0.046 9038	1.114 042	0.897 6226	0.138	0.068 6185	1.171 000	0.853 8468
0.109	0.047 3381	1.115 152	0.896 7204	0.139	0.069 0528	1.172 338	0.852 9904
0.110	0.047 7724	1.116 266	0.895 8131	0.140	0.069 4871	1.173 511	0.852 1438
0.111	0.048 2067	1.117 383	0.894 9087	0.141	0.069 9214	1.174 685	0.851 2921
0.112	0.048 6410	1.118 513	0.894 0043	0.142	0.070 3557	1.175 860	0.850 4412
0.113	0.049 0753	1.119 632	0.893 1007	0.143	0.070 7900	1.177 037	0.849 5912
0.114	0.049 5096	1.120 752	0.892 2580	0.144	0.071 2243	1.178 214	0.848 7420
0.115	0.049 9439	1.121 873	0.891 3661	0.145	0.071 6586	1.179 393	0.847 8937
0.116	0.050 3782	1.122 996	0.890 4752	0.146	0.072 0929	1.180 573	0.847 0462
0.117	0.050 8125	1.124 119	0.889 5852	0.147	0.072 5272	1.181 754	0.846 1996
0.118	0.051 2467	1.125 244	0.888 6961	0.148	0.072 9615	1.182 937	0.845 3538
0.119	0.051 6810	1.126 370	0.887 8076	0.149	0.073 3958	1.184 120	0.844 5089
0.120	0.052 1153	1.127 497	0.886 9204	0.150	0.073 8301	1.185 305	0.843 6648
0.121	0.052 5496	1.128 625	0.886 0340	0.151	0.074 2644	1.186 491	0.842 8216
0.122	0.052 9839	1.129 754	0.885 1484	0.152	0.074 6987	1.187 678	0.841 9792
0.123	0.053 4182	1.130 884	0.884 2637	0.153	0.075 1330	1.188 865	0.841 1376
0.124	0.053 8525	1.132 016	0.883 3798	0.154	0.075 5673	1.190 050	0.840 2969
0.125	0.054 2868	1.133 148	0.882 4960	0.155	0.076 0015	1.191 245	0.839 4570
0.126	0.054 7211	1.134 282	0.881 6138	0.156	0.076 4358	1.192 438	0.838 6180
0.127	0.055 1554	1.135 417	0.880 7337	0.157	0.076 8701	1.193 631	0.837 7798
0.128	0.055 5897	1.136 551	0.879 8534	0.158	0.077 3044	1.194 825	0.836 9424
0.129	0.056 0240	1.137 690	0.878 9740	0.159	0.077 7387	1.196 021	0.836 1059
0.130	0.056 4583	1.138 826	0.878 0934	0.160	0.078 1730	1.197 217	0.835 2702
0.131	0.056 8926	1.139 968	0.877 2178	0.161	0.078 6073	1.198 415	0.834 4354
0.132	0.057 3269	1.141 108	0.876 3410	0.162	0.079 0416	1.199 614	0.833 6013
0.133	0.057 7612	1.142 250	0.875 4651	0.163	0.079 4759	1.200 814	0.832 7682
0.134	0.058 1955	1.143 393	0.874 5901	0.164	0.079 9102	1.202 016	0.831 9358
0.135	0.058 6298	1.144 537	0.873 7159	0.165	0.080 3445	1.203 218	0.831 1043
0.136	0.059 0640	1.145 682	0.872 8436	0.166	0.080 7788	1.204 422	0.830 2736
0.137	0.059 4983	1.146 828	0.871 9722	0.167	0.081 2131	1.205 627	0.829 4437
0.138	0.059 9326	1.147 976	0.871 1027	0.168	0.081 6474	1.206 834	0.828 6147
0.139	0.060 3669	1.149 124	0.870 2280	0.169	0.082 0817	1.208 041	0.827 7865
0.140	0.060 8012	1.150 274	0.869 3582	0.170	0.082 5160	1.209 250	0.826 9591
0.141	0.061 2355	1.151 425	0.868 4893	0.171	0.082 9502	1.210 459	0.826 1326
0.142	0.061 6698	1.152 577	0.867 6213	0.172	0.083 3845	1.211 671	0.825 3069
0.143	0.062 1041	1.153 730	0.866 7541	0.173	0.083 8188	1.212 883	0.824 4820
0.144	0.062 5384	1.154 881	0.865 8877	0.174	0.084 2531	1.214 096	0.823 6579
0.145	0.062 9727	1.156 040	0.865 0223	0.175	0.084 6874	1.215 311	0.822 8347
0.146	0.063 4070	1.157 195	0.864 1577	0.176	0.085 1217	1.216 527	0.822 0122
0.147	0.063 8413	1.158 354	0.863 2940	0.177	0.085 5560	1.217 744	0.821 1906
0.148	0.064 2756	1.159 513	0.862 4311	0.178	0.085 9903	1.218 962	0.820 3699
0.149	0.064 7099	1.160 673	0.861 5691	0.179	0.086 4246	1.220 182	0.819 5499
0.150	0.065 1442	1.161 834	0.860 7080	0.200	0.086 8589	1.221 403	0.818 7308
$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}	$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}

SMITHSONIAN TABLE

The Exponential.

n	$\log_{10}(e^n)$	e^n	e^{-n}	n	$\log_{10}(e^n)$	e^n	e^{-n}
0.200	0.086 8589	1.221 402	0.818 7308	0.290	0.108 5736	1.264 035	0.778 8008
0.201	0.087 2032	1.222 625	0.817 9124	0.291	0.109 0079	1.265 310	0.778 0224
0.202	0.087 7275	1.223 846	0.817 0940	0.292	0.109 4423	1.266 596	0.777 2447
0.203	0.088 1618	1.225 072	0.816 2782	0.293	0.109 8765	1.267 883	0.776 4679
0.204	0.088 5961	1.226 298	0.815 4624	0.294	0.110 3108	1.269 179	0.775 6918
0.205	0.089 0304	1.227 525	0.814 6473	0.295	0.110 7451	1.290 462	0.774 9165
0.206	0.089 4647	1.228 753	0.813 8331	0.296	0.111 1794	1.291 753	0.774 1420
0.207	0.089 8990	1.229 983	0.813 0205	0.297	0.111 6137	1.293 045	0.773 3682
0.208	0.090 3333	1.231 213	0.812 2070	0.298	0.112 0480	1.294 330	0.772 5952
0.209	0.090 7675	1.232 445	0.811 3952	0.299	0.112 4823	1.295 624	0.771 8230
0.210	0.091 2018	1.233 678	0.810 5842	0.300	0.112 9166	1.296 920	0.771 0516
0.211	0.091 6361	1.234 913	0.809 7741	0.301	0.113 3509	1.298 228	0.770 2809
0.212	0.092 0704	1.236 148	0.808 9647	0.302	0.113 7852	1.299 527	0.769 5110
0.213	0.092 5047	1.237 385	0.808 1561	0.303	0.114 2194	1.300 827	0.768 7419
0.214	0.092 9390	1.238 623	0.807 3484	0.304	0.114 6537	1.302 128	0.767 9735
0.215	0.093 3733	1.239 862	0.806 5414	0.305	0.115 0880	1.303 431	0.767 2059
0.216	0.093 8076	1.241 100	0.805 7353	0.306	0.115 5223	1.304 735	0.766 4391
0.217	0.094 2419	1.242 344	0.804 9300	0.307	0.115 9566	1.306 040	0.765 6731
0.218	0.094 6762	1.243 587	0.804 1254	0.308	0.116 3909	1.307 347	0.764 9078
0.219	0.095 1105	1.244 831	0.803 3217	0.309	0.116 8252	1.308 655	0.764 1433
0.220	0.095 5448	1.246 077	0.802 5188	0.310	0.117 2595	1.309 964	0.763 3795
0.221	0.095 9791	1.247 323	0.801 7167	0.311	0.117 6938	1.311 275	0.762 6165
0.222	0.096 4134	1.248 571	0.800 9154	0.312	0.118 1281	1.312 587	0.761 8543
0.223	0.096 8477	1.249 821	0.800 1148	0.313	0.118 5624	1.313 900	0.761 0926
0.224	0.097 2820	1.251 071	0.799 3151	0.314	0.118 9967	1.315 215	0.760 3321
0.225	0.097 7163	1.252 323	0.798 5169	0.315	0.119 4310	1.316 531	0.759 5721
0.226	0.098 1506	1.253 576	0.797 7181	0.316	0.119 8653	1.317 848	0.758 8129
0.227	0.098 5849	1.254 830	0.796 9208	0.317	0.120 2996	1.319 166	0.758 0543
0.228	0.099 0191	1.256 085	0.796 1243	0.318	0.120 7339	1.320 486	0.757 2968
0.229	0.099 4534	1.257 343	0.795 3285	0.319	0.121 1682	1.321 807	0.756 5399
0.230	0.099 8877	1.258 600	0.794 5336	0.320	0.121 6025	1.323 130	0.755 7837
0.231	0.100 3220	1.259 859	0.793 7395	0.321	0.122 0367	1.324 454	0.755 0283
0.232	0.100 7563	1.261 120	0.792 9461	0.322	0.122 4710	1.325 779	0.754 2737
0.233	0.101 1906	1.262 381	0.792 1536	0.323	0.122 9053	1.327 105	0.753 5198
0.234	0.101 6249	1.263 644	0.791 3618	0.324	0.123 3396	1.328 433	0.752 7666
0.235	0.102 0592	1.264 909	0.790 5708	0.325	0.123 7739	1.329 762	0.752 0143
0.236	0.102 4935	1.266 174	0.789 7807	0.326	0.124 2082	1.331 092	0.751 2626
0.237	0.102 9278	1.267 444	0.788 9913	0.327	0.124 6425	1.332 424	0.750 5117
0.238	0.103 3621	1.268 709	0.788 2027	0.328	0.125 0768	1.333 757	0.749 7616
0.239	0.103 7964	1.269 979	0.787 4149	0.329	0.125 5111	1.335 092	0.749 0122
0.240	0.104 2307	1.271 249	0.786 6279	0.330	0.125 9454	1.336 427	0.748 2636
0.241	0.104 6650	1.272 521	0.785 8416	0.331	0.126 3797	1.337 765	0.747 5157
0.242	0.105 0993	1.273 794	0.785 0564	0.332	0.126 8140	1.339 103	0.746 7685
0.243	0.105 5336	1.275 069	0.784 2713	0.333	0.127 2483	1.340 443	0.746 0221
0.244	0.105 9679	1.276 344	0.783 4870	0.334	0.127 6826	1.341 784	0.745 2765
0.245	0.106 4021	1.277 621	0.782 7045	0.335	0.128 1169	1.343 126	0.744 5316
0.246	0.106 8364	1.278 900	0.781 9222	0.336	0.128 5512	1.344 470	0.743 7874
0.247	0.107 2707	1.280 179	0.781 1407	0.337	0.128 9855	1.345 815	0.743 0440
0.248	0.107 7050	1.281 460	0.780 3599	0.338	0.129 4198	1.347 162	0.742 3013
0.249	0.108 1393	1.282 742	0.779 5800	0.339	0.129 8541	1.348 510	0.741 5594
0.250	0.108 5736	1.284 025	0.778 8008	0.300	0.130 2883	1.349 859	0.740 8182
$\log_{10}(e^n)$	$\log_{10}(e^n)$	e^n	e^{-n}	$\log_{10}(e^n)$	$\log_{10}(e^n)$	e^n	e^{-n}

The Exponential.

u	$\log_e(u^e)$	e^u	e^{-u}	u	$\log_e(u^e)$	e^u	e^{-u}
0.300	0.130 2883	1.340 539	0.740 8183	0.350	0.158 0031	1.419 078	0.704 6881
0.301	0.130 7226	1.351 209	0.740 0728	0.351	0.158 4374	1.430 487	0.703 0838
0.302	0.131 1569	1.352 561	0.739 3381	0.352	0.158 8717	1.431 909	0.702 4801
0.303	0.131 5912	1.353 914	0.738 6034	0.353	0.159 3060	1.433 331	0.701 8772
0.304	0.132 0255	1.355 269	0.737 8689	0.354	0.159 7403	1.434 755	0.701 2750
0.305	0.132 4598	1.356 625	0.737 1234	0.355	0.160 1745	1.436 181	0.700 6731
0.306	0.132 8941	1.357 982	0.736 3806	0.356	0.160 6088	1.437 608	0.700 0726
0.307	0.133 3284	1.359 341	0.735 6366	0.357	0.161 0431	1.439 036	0.699 4735
0.308	0.133 7627	1.360 701	0.734 8915	0.358	0.161 4774	1.440 466	0.698 8751
0.309	0.134 1970	1.362 062	0.734 1468	0.359	0.161 9117	1.441 897	0.698 2784
0.310	0.134 6313	1.363 425	0.733 4020	0.360	0.162 3460	1.443 329	0.697 6833
0.311	0.135 0656	1.364 789	0.732 6573	0.361	0.162 7803	1.444 763	0.697 0899
0.312	0.135 4999	1.366 155	0.731 9115	0.362	0.163 2146	1.446 199	0.696 4981
0.313	0.135 9342	1.367 522	0.731 1649	0.363	0.163 6489	1.447 636	0.695 9079
0.314	0.136 3685	1.368 890	0.730 4180	0.364	0.164 0832	1.449 073	0.695 3192
0.315	0.136 8028	1.370 259	0.729 6710	0.365	0.164 5175	1.450 514	0.694 7322
0.316	0.137 2371	1.371 630	0.728 9245	0.366	0.164 9518	1.451 955	0.694 1468
0.317	0.137 6714	1.373 001	0.728 1778	0.367	0.165 3861	1.453 398	0.693 5630
0.318	0.138 1056	1.374 376	0.727 4308	0.368	0.165 8204	1.454 843	0.692 9807
0.319	0.138 5399	1.375 751	0.726 6835	0.369	0.166 2547	1.456 288	0.692 3994
0.320	0.138 9742	1.377 128	0.725 9363	0.370	0.166 6890	1.457 735	0.691 8193
0.321	0.139 4085	1.378 506	0.725 1893	0.371	0.167 1233	1.459 183	0.691 2409
0.322	0.139 8428	1.379 885	0.724 4422	0.372	0.167 5575	1.460 633	0.690 6642
0.323	0.140 2771	1.381 266	0.723 6949	0.373	0.167 9918	1.462 084	0.690 0891
0.324	0.140 7114	1.382 647	0.722 9472	0.374	0.168 4261	1.463 537	0.689 5156
0.325	0.141 1457	1.384 031	0.722 1997	0.375	0.168 8604	1.464 991	0.688 9433
0.326	0.141 5800	1.385 415	0.721 4522	0.376	0.169 2947	1.466 447	0.688 3723
0.327	0.142 0143	1.386 801	0.720 7047	0.377	0.169 7290	1.467 904	0.687 8035
0.328	0.142 4486	1.388 189	0.720 0569	0.378	0.170 1633	1.469 363	0.687 2368
0.329	0.142 8829	1.389 578	0.719 3089	0.379	0.170 5976	1.470 823	0.686 6723
0.330	0.143 3172	1.390 968	0.718 5617	0.380	0.171 0319	1.472 285	0.686 1094
0.331	0.143 7515	1.392 360	0.717 8145	0.381	0.171 4662	1.473 748	0.685 5481
0.332	0.144 1858	1.393 753	0.717 0673	0.382	0.171 9005	1.475 212	0.684 9885
0.333	0.144 6201	1.395 147	0.716 3202	0.383	0.172 3348	1.476 678	0.684 4306
0.334	0.145 0544	1.396 543	0.715 5738	0.384	0.172 7691	1.478 145	0.683 8744
0.335	0.145 4887	1.397 940	0.714 8271	0.385	0.173 2034	1.479 614	0.683 3199
0.336	0.145 9230	1.399 339	0.714 0803	0.386	0.173 6377	1.481 085	0.682 7671
0.337	0.146 3572	1.400 739	0.713 3338	0.387	0.174 0720	1.482 556	0.682 2161
0.338	0.146 7915	1.402 141	0.712 5873	0.388	0.174 5063	1.484 030	0.681 6678
0.339	0.147 2258	1.403 543	0.711 8404	0.389	0.174 9406	1.485 505	0.681 1213
0.340	0.147 6601	1.404 948	0.711 0933	0.390	0.175 3749	1.486 981	0.680 5766
0.341	0.148 0944	1.406 353	0.710 3463	0.391	0.175 8092	1.488 459	0.680 0337
0.342	0.148 5287	1.407 760	0.709 6002	0.392	0.176 2435	1.489 938	0.679 4924
0.343	0.148 9630	1.409 169	0.708 8542	0.393	0.176 6777	1.491 418	0.678 9527
0.344	0.149 3973	1.410 579	0.708 1089	0.394	0.177 1120	1.492 899	0.678 4147
0.345	0.149 8316	1.411 990	0.707 3644	0.395	0.177 5463	1.494 381	0.677 8783
0.346	0.150 2659	1.413 403	0.706 6205	0.396	0.177 9806	1.495 865	0.677 3435
0.347	0.150 7002	1.414 817	0.705 8769	0.397	0.178 4149	1.497 350	0.676 8103
0.348	0.151 1345	1.416 233	0.705 1339	0.398	0.178 8492	1.498 836	0.676 2787
0.349	0.151 5688	1.417 649	0.704 3911	0.399	0.179 2835	1.499 324	0.675 7487
0.350	0.152 0031	1.419 068	0.703 6481	0.400	0.179 7178	1.500 815	0.675 2200
$\log_e(e^u)$	$\log_e(u^e)$	e^u	e^{-u}	$\log_e(e^u)$	$\log_e(u^e)$	e^u	e^{-u}

The Exponential.

x	$\log_{10}(e^x)$	e^x	e^{-x}	x	$\log_{10}(e^x)$	e^x	e^{-x}
0.400	0.173 7178	1.401 825	0.709 3200	0.480	0.198 4325	1.568 312	0.637 6282
.401	.174 1521	.403 317	.690 6501	.481	.198 8008	.569 881	.636 9908
.402	.174 5854	.404 811	.688 9807	.482	.199 2071	.571 452	.636 3542
.403	.175 0207	.405 307	.688 3121	.483	.199 6354	.573 024	.635 7181
.404	.175 4550	.407 804	.687 6441	.484	.199 1057	.574 598	.635 0847
0.405	0.175 8893	1.409 303	0.696 9768	0.485	0.199 6040	1.576 173	0.634 4480
.406	.176 3236	.500 803	.696 3102	.486	.199 0383	.577 790	.633 8138
.407	.176 7570	.502 304	.695 6442	.487	.198 4726	.579 389	.633 1803
.408	.177 1913	.503 807	.694 9789	.488	.198 9069	.580 989	.632 5475
.409	.177 6256	.505 312	.694 3142	.489	.199 3412	.582 491	.631 9152
0.410	0.178 0607	1.506 818	0.693 6503	0.490	0.199 7755	1.584 074	0.631 2836
.411	.178 4950	.508 325	.692 9859	.491	.200 2098	.585 689	.630 6527
.412	.178 9293	.509 834	.692 3213	.492	.200 6441	.587 245	.630 0223
.413	.179 3636	.511 345	.691 6623	.493	.201 0783	.588 833	.629 3928
.414	.179 7979	.512 857	.691 0010	.494	.201 5126	.590 423	.628 7636
0.415	0.180 2322	1.514 371	0.690 3403	0.495	0.201 9469	1.592 014	0.628 1351
.416	.180 6665	.515 886	.689 6803	.496	.202 3812	.593 609	.627 5073
.417	.181 1008	.517 403	.689 0200	.497	.202 8155	.595 201	.626 8801
.418	.181 5351	.518 921	.688 3622	.498	.203 2498	.596 797	.626 2535
.419	.181 9694	.520 440	.687 7042	.499	.203 6841	.598 395	.625 6276
0.420	0.182 4037	1.521 962	0.687 0468	0.490	0.204 1184	1.599 994	0.625 0023
.421	.182 8380	.523 484	.686 3901	.491	.204 5527	.601 595	.624 3776
.422	.183 2723	.525 009	.685 7340	.492	.204 9870	.603 197	.623 7535
.423	.183 7066	.526 531	.685 0786	.493	.205 4213	.604 801	.623 1301
.424	.184 1409	.528 052	.684 4239	.494	.205 8556	.606 407	.622 5073
0.425	0.184 5752	1.529 590	0.683 7698	0.495	0.206 2899	1.608 014	0.621 8831
.426	.185 0094	.531 121	.683 1163	.496	.206 7242	.609 623	.621 2595
.427	.185 4437	.532 653	.682 4630	.497	.207 1585	.611 233	.620 6325
.428	.185 8780	.534 185	.681 8114	.498	.207 5928	.612 845	.620 0022
.429	.186 3123	.535 721	.681 1599	.499	.208 0271	.614 459	.619 4025
0.430	0.186 7466	1.537 268	0.680 5091	0.490	0.208 4614	1.616 074	0.618 7834
.431	.187 1809	.538 795	.679 8580	.491	.208 8956	.617 691	.618 1640
.432	.187 6152	.540 335	.679 2054	.492	.209 3299	.619 310	.617 5471
.433	.188 0495	.541 876	.678 5505	.493	.209 7642	.620 930	.616 9308
.434	.188 4838	.543 419	.677 8923	.494	.210 1985	.622 552	.616 3132
0.435	0.188 9181	1.544 963	0.677 2617	0.495	0.210 6328	1.624 175	0.615 6972
.436	.189 3524	.546 509	.676 6177	.496	.211 0671	.625 800	.615 0818
.437	.189 7867	.548 056	.675 9714	.497	.211 5014	.627 427	.614 4670
.438	.190 2210	.549 605	.675 3258	.498	.211 9357	.629 055	.613 8539
.439	.190 6553	.551 155	.674 6808	.499	.212 3700	.630 685	.613 2393
0.440	0.191 0896	1.556 707	0.674 0364	0.490	0.212 8043	1.632 316	0.612 6254
.441	.191 5239	.554 261	.673 3907	.491	.213 2386	.633 939	.612 0141
.442	.191 9582	.555 816	.672 7450	.492	.213 6729	.635 564	.611 4044
.443	.192 3925	.557 372	.672 0992	.493	.214 1072	.637 191	.610 7943
.444	.192 8267	.558 930	.671 4554	.494	.214 5415	.638 820	.610 1868
0.445	0.193 2610	1.560 490	0.670 8241	0.495	0.214 9758	1.640 498	0.609 5709
.446	.193 6953	.562 051	.670 1838	.496	.215 4101	.642 150	.608 9566
.447	.194 1296	.563 614	.669 5439	.497	.215 8444	.643 783	.608 3530
.448	.194 5639	.565 179	.668 9047	.498	.216 2787	.645 427	.607 7449
.449	.194 9982	.566 745	.668 2661	.499	.216 7130	.647 073	.607 1375
0.450	0.195 4325	1.568 312	0.667 6282	0.500	0.217 1473	1.648 721	0.606 5307
$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}	$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}

The Exponential.

x	$\log_{10}(e^x)$	e^x	e^{-x}	x	$\log_{10}(e^x)$	e^x	e^{-x}
0.500	0.217 1472	1.648 721	0.606 5307	0.550	0.238 8020	1.733 253	0.576 019
.501	.217 3815	.660 371	.605 044	.551	.239 2043	.734 987	.576 373
.502	.218 0158	.662 022	.603 5188	.552	.240 7300	.736 743	.575 707
.503	.218 4591	.663 675	.602 7138	.553	.240 8148	.738 491	.575 220
.504	.218 8814	.665 320	.601 1094	.554	.240 9091	.740 230	.574 693
0.505	0.219 3187	1.666 966	0.600 3096	0.555	0.241 0334	1.741 941	0.574 072
.506	.219 7530	.668 643	.600 0024	.556	.241 0977	.743 681	.573 498
.507	.220 1873	.670 303	.600 2968	.557	.241 9020	.745 458	.572 945
.508	.220 6216	.671 964	.601 6028	.558	.242 3393	.747 275	.572 358
.509	.221 0559	.673 627	.601 0941	.559	.242 7766	.749 123	.571 780
0.510	0.221 4902	1.668 291	0.600 4096	0.560	0.243 3019	1.750 973	0.571 2091
.511	.221 9245	.670 957	.600 8051	.561	.243 3962	.752 748	.570 6381
.512	.222 3588	.672 625	.601 2005	.562	.244 0733	.754 577	.570 0667
.513	.222 7931	.674 295	.601 6968	.563	.244 5078	.756 434	.569 488
.514	.223 2274	.675 966	.601 084	.564	.244 9421	.758 320	.568 928
0.515	0.223 6617	1.673 630	0.602 5006	0.565	0.245 3764	1.759 248	0.568 3601
.516	.224 0960	.675 313	.602 9031	.566	.245 8107	.761 208	.567 7918
.517	.224 5302	.676 989	.603 3088	.567	.246 2450	.763 070	.567 2236
.518	.224 9645	.678 667	.603 7168	.568	.246 6793	.764 734	.566 6560
.519	.225 3988	.680 345	.604 1154	.569	.247 1136	.766 500	.566 0912
0.520	0.225 8331	1.682 028	0.604 5205	0.570	0.247 5479	1.768 367	0.565 5254
.521	.226 2674	.683 711	.604 9263	.571	.247 9821	.770 236	.564 9602
.522	.226 7017	.685 395	.605 3347	.572	.248 4164	.772 107	.564 3955
.523	.227 1360	.687 081	.605 7397	.573	.248 8507	.773 980	.563 8314
.524	.227 5703	.688 760	.606 1472	.574	.249 2850	.775 854	.563 2670
0.525	0.228 0046	1.690 480	0.606 5554	0.575	0.249 7193	1.777 731	0.562 7040
.526	.228 4389	.692 150	.606 9631	.576	.250 1536	.779 608	.562 1424
.527	.228 8732	.693 813	.607 3734	.577	.250 5879	.781 488	.561 5806
.528	.229 3075	.695 478	.607 7834	.578	.251 0222	.783 370	.561 0193
.529	.229 7418	.697 144	.608 1939	.579	.251 4565	.785 253	.560 4586
0.530	0.230 1761	1.698 632	0.608 6050	0.580	0.251 8908	1.789 098	0.559 8981
.531	.230 6104	.699 312	.609 0167	.581	.252 3251	.790 925	.559 3379
.532	.231 0447	.702 331	.609 4280	.582	.252 7594	.792 841	.558 7777
.533	.231 4790	.704 037	.609 8418	.583	.253 1937	.794 765	.558 2174
.534	.231 9133	.705 744	.610 2553	.584	.253 6280	.796 687	.557 6572
0.535	0.232 3475	1.707 448	0.610 6693	0.585	0.254 0623	1.794 191	0.557 1059
.536	.232 7818	.709 157	.611 0830	.586	.254 4966	.796 707	.556 5520
.537	.233 2161	.710 867	.611 4971	.587	.254 9309	.798 605	.556 0048
.538	.233 6504	.712 578	.611 9140	.588	.255 3652	.800 394	.555 4570
.539	.234 0847	.714 289	.612 3313	.589	.255 7995	.802 185	.554 8819
0.540	0.234 5190	1.716 007	0.612 7483	0.590	0.256 2337	1.803 988	0.554 3273
.541	.234 9533	.717 724	.613 1658	.591	.256 6680	.805 793	.553 7732
.542	.235 3876	.719 442	.613 5832	.592	.257 1023	.807 600	.553 2197
.543	.235 8219	.721 153	.614 0005	.593	.257 5366	.809 409	.552 6668
.544	.236 2562	.722 865	.614 4179	.594	.257 9709	.811 219	.552 1144
0.545	0.236 6905	1.724 608	0.614 8348	0.595	0.258 4052	1.813 031	0.551 5626
.546	.237 1248	.726 334	.615 2522	.596	.258 8395	.814 845	.551 0113
.547	.237 5591	.728 061	.615 6693	.597	.259 2738	.816 661	.550 4605
.548	.237 9934	.729 790	.616 0860	.598	.259 7081	.818 478	.549 9101
.549	.238 4277	.731 521	.616 5027	.599	.260 1424	.820 298	.549 3607
0.550	0.238 8620	1.733 253	0.616 9408	0.600	0.260 5767	1.822 119	0.548 8116
$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}	$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}

SMITHSONIAN TABLES

The Exponential.

x	$\log_{10}(e^x)$	e^x	e^{-x}	x	$\log_{10}(e^x)$	e^x	e^{-x}
0.600	0.260 5767	1.822 119	0.548 8116	0.650	0.382 2914	1.915 541	0.530 0458
0.601	.261 0110	.823 942	.548 2631	.651	.382 7257	.917 457	.529 5220
0.602	.261 4453	.825 767	.547 7151	.652	.383 1600	.919 376	.529 0027
0.603	.261 8796	.827 593	.547 1677	.653	.383 5943	.921 295	.528 4830
0.604	.262 3139	.829 422	.546 6208	.654	.384 0286	.923 218	.527 9618
0.605	0.262 7482	1.831 252	0.546 0744	0.655	0.384 4629	1.925 143	0.519 4421
0.606	.263 1825	.833 081	.545 5280	.656	.384 8972	.927 069	.518 9229
0.607	.263 6168	.834 918	.544 9814	.657	.385 3315	.928 997	.518 4032
0.608	.264 0510	.836 754	.544 4367	.658	.385 7658	.930 927	.517 8861
0.609	.264 4853	.838 592	.543 8915	.659	.386 2001	.932 859	.517 3684
0.610	0.264 9196	1.840 431	0.543 3509	0.660	0.386 6344	1.934 793	0.516 8513
0.611	.265 3539	.842 273	.542 8078	0.661	.387 0687	.936 728	.516 3347
0.612	.265 7882	.844 116	.542 2653	0.662	.387 5030	.938 666	.515 8187
0.613	.266 2225	.845 961	.541 7233	0.663	.387 9373	.940 606	.515 3031
0.614	.266 6568	.847 808	.541 1818	0.664	.388 3715	.942 547	.514 7881
0.615	0.267 0911	1.842 657	0.540 6409	0.665	0.388 8058	1.944 481	0.514 2735
0.616	.267 5254	.844 507	.540 1005	0.666	.389 2401	.946 426	.513 7598
0.617	.267 9597	.846 350	.539 5597	0.667	.389 6744	.948 373	.513 2460
0.618	.268 3940	.848 195	.539 0214	0.668	.390 1087	.950 321	.512 7330
0.619	.268 8283	.850 040	.538 4827	0.669	.390 5430	.952 274	.512 2205
0.620	0.269 2626	1.844 028	0.537 9444	0.670	0.390 9773	1.954 237	0.511 7086
0.621	.269 6969	.851 878	.537 4068	0.671	.391 4116	.956 193	.511 1971
0.622	.270 1312	.853 730	.536 8690	0.672	.391 8459	.958 150	.510 6862
0.623	.270 5655	.855 583	.536 3330	0.673	.392 2802	.960 109	.510 1768
0.624	.270 9998	.857 437	.535 7970	0.674	.392 7145	.962 070	.509 6658
0.625	0.271 4341	1.846 246	0.535 2614	0.675	0.393 1488	1.956 033	0.509 1564
0.626	.271 8684	.859 115	.534 7264	0.676	.393 5831	.958 008	.508 6475
0.627	.272 3026	.861 980	.534 1920	0.677	.394 0174	.960 986	.508 1391
0.628	.272 7369	.863 850	.533 6581	0.678	.394 4517	.962 964	.507 6312
0.629	.273 1712	.865 724	.533 1247	0.679	.394 8860	.964 945	.507 1230
0.630	0.273 6055	1.847 611	0.532 5918	0.680	0.395 3202	1.957 878	0.506 6170
0.631	.274 0398	.867 489	.532 0585	0.681	.395 7545	.959 852	.506 1106
0.632	.274 4741	.869 370	.531 5257	0.682	.396 1888	.961 829	.505 6048
0.633	.274 9084	.871 252	.530 9964	0.683	.396 6231	.963 808	.505 0994
0.634	.275 3427	.873 136	.530 4657	0.684	.397 0574	.965 789	.504 5946
0.635	0.275 7770	1.849 622	0.530 9355	0.685	0.397 4917	1.960 772	0.504 0902
0.636	.276 2113	.875 510	.530 4058	0.686	.397 9260	.962 757	.503 5864
0.637	.276 6456	.877 400	.529 8767	0.687	.398 3603	.964 734	.503 0831
0.638	.277 0799	.879 292	.529 3481	0.688	.398 7946	.966 712	.502 5802
0.639	.277 5142	.881 185	.528 8200	0.689	.399 2289	.968 691	.502 0779
0.640	0.277 9485	1.851 481	0.528 2924	0.690	0.399 6632	1.962 716	0.501 5761
0.641	.278 3828	.883 378	.527 7654	0.691	.399 0975	.964 710	.501 0747
0.642	.278 8171	.885 278	.527 2380	0.692	.399 5318	.966 707	.500 5730
0.643	.279 2514	.887 179	.526 7120	0.693	.399 9661	.968 706	.500 0716
0.644	.279 6856	.889 082	.526 1875	0.694	.400 4004	1.966 706	.499 5738
0.645	0.280 1199	1.853 987	0.525 6625	0.695	0.400 8347	1.968 709	0.499 0744
0.646	.280 5542	.891 894	.525 1381	0.696	.401 2690	.968 714	.498 5799
0.647	.280 9885	.893 803	.524 6143	0.697	.401 7033	.969 721	.498 0821
0.648	.281 4228	.895 714	.524 0900	0.698	.402 1375	.970 729	.497 5855
0.649	.281 8571	.897 626	.523 5681	0.699	.402 5718	.971 740	.497 0881
0.650	0.282 2914	1.855 541	0.523 0458	0.700	0.403 0061	1.971 753	0.496 5853
$\log(e^x)$	$\log(e^x)$	e^x	e^{-x}	$\log(e^x)$	$\log(e^x)$	e^x	e^{-x}

The Exponential.

x	$\log_e(x^2)$	e^x	e^{-x}	x	$\log_e(x^2)$	e^x	e^{-x}
0.700	0.304 0061	2.013 753	0.495 5853	0.750	0.325 7209	2.117 000	0.472 3666
.701	.304 4404	.015 767	.495 0809	.751	.326 1552	.119 118	.471 8604
.702	.304 8747	.017 784	.495 5931	.752	.326 5895	.121 218	.471 4428
.703	.305 3090	.019 803	.495 9978	.753	.327 0237	.123 361	.470 9816
.704	.305 7433	.021 824	.496 4009	.754	.327 4580	.125 485	.470 4809
0.705	0.306 1776	2.023 847	0.494 1086	0.755	0.327 8923	2.127 612	0.470 6106
.706	.306 6119	.025 872	.493 6147	.756	.328 3266	.129 740	.469 5408
.707	.307 0462	.027 898	.493 1213	.757	.328 7609	.131 871	.469 0715
.708	.307 4806	.029 927	.492 6285	.758	.329 1952	.134 004	.468 6027
.709	.307 9148	.031 958	.492 1361	.759	.329 6295	.136 130	.468 1343
0.710	0.308 3491	2.033 991	0.491 6442	0.760	0.330 0638	2.138 276	0.467 6664
.711	.308 7834	.035 026	.491 1528	.761	.330 4981	.140 416	.467 1990
.712	.309 2177	.038 063	.490 6619	.762	.330 9324	.142 557	.466 7320
.713	.309 6520	.040 169	.490 1715	.763	.331 3667	.144 701	.466 2655
.714	.310 0863	.042 144	.489 6815	.764	.331 8010	.146 846	.465 7995
0.715	0.310 5206	2.044 187	0.489 1921	0.765	0.332 2353	2.148 994	0.465 3330
.716	.310 9548	.046 232	.488 7032	.766	.332 6696	.151 144	.464 8688
.717	.311 3891	.048 299	.488 2147	.767	.333 1039	.153 297	.464 4042
.718	.311 8234	.050 368	.487 7267	.768	.333 5382	.155 451	.463 9400
.719	.312 2577	.052 380	.487 2393	.769	.333 9725	.157 608	.463 4763
0.720	0.312 6920	2.054 433	0.486 7523	0.770	0.334 4068	2.159 766	0.463 0131
.721	.313 1263	.056 480	.486 2657	.771	.334 8410	.161 927	.462 5503
.722	.313 5606	.058 540	.485 7707	.772	.335 2753	.164 090	.462 0880
.723	.313 9949	.060 606	.485 2861	.773	.335 7096	.166 255	.461 6261
.724	.314 4292	.062 667	.484 8001	.774	.336 1439	.168 423	.461 1647
0.725	0.314 8635	2.064 730	0.484 3146	0.775	0.336 5782	2.170 992	0.460 7038
.726	.315 2978	.066 797	.483 8295	.776	.337 0125	.172 761	.460 2433
.727	.315 7321	.068 865	.483 3399	.777	.337 4468	.174 938	.459 7833
.728	.316 1664	.070 935	.482 8518	.778	.337 8811	.177 114	.459 3237
.729	.316 6007	.073 007	.482 3611	.779	.338 3154	.179 292	.458 8646
0.730	0.317 0350	2.075 081	0.481 8760	0.780	0.338 7497	2.181 472	0.458 4060
.731	.317 4693	.077 157	.481 4273	.781	.339 1840	.183 655	.457 9478
.732	.317 9036	.079 235	.480 9460	.782	.339 6183	.185 830	.457 4901
.733	.318 3379	.081 315	.480 4654	.783	.340 0526	.188 027	.457 0320
.734	.318 7722	.083 398	.479 9852	.784	.340 4869	.190 216	.456 5760
0.735	0.319 2064	2.085 484	0.479 5055	0.785	0.340 9212	2.192 407	0.456 1197
.736	.319 6407	.085 569	.479 0260	.786	.341 3555	.194 600	.455 6638
.737	.320 0750	.087 657	.478 5474	.787	.341 7898	.196 795	.455 2084
.738	.320 5093	.089 748	.478 0691	.788	.342 2241	.198 994	.454 7534
.739	.320 9436	.091 841	.477 5913	.789	.342 6583	.201 194	.454 2989
0.740	0.321 3779	2.095 636	0.477 1139	0.790	0.343 0926	2.203 396	0.453 8448
.741	.321 8122	.093 939	.476 6370	.791	.343 5269	.205 601	.453 3912
.742	.322 2465	.100 132	.476 1606	.792	.343 9612	.207 808	.452 9380
.743	.322 6808	.102 233	.475 6847	.793	.344 3955	.210 017	.452 4853
.744	.323 1151	.104 336	.475 2093	.794	.344 8298	.212 228	.452 0330
0.745	0.323 5494	2.106 441	0.474 7343	0.795	0.345 2641	2.214 441	0.451 5812
.746	.323 9837	.108 549	.474 2598	.796	.345 6984	.216 657	.451 1309
.747	.324 4180	.110 659	.473 7858	.797	.346 1327	.218 874	.450 6800
.748	.324 8523	.112 770	.473 3122	.798	.346 5670	.221 094	.450 2285
.749	.325 2866	.114 884	.472 8394	.799	.347 0013	.223 316	.449 7785
0.750	0.325 7209	2.117 000	0.472 3666	0.800	0.347 4356	2.225 541	0.449 3290
$\log_e(x^2)$	$\log_e(x^2)$	e^x	e^{-x}	$\log_e(x^2)$	$\log_e(x^2)$	e^x	e^{-x}

The Exponential.

n	$\log_{10}(e^n)$	e^n	e^{-n}	n	$\log_{10}(e^n)$	e^n	e^{-n}
0.800	0.347 4356	2.225 541	0.449 3286	0.850	0.369 1503	2.339 647	0.427 4149
.801	.347 8909	.227 768	.448 8799	.851	.369 5946	.341 688	.426 9877
.802	.348 3462	.229 096	.448 4312	.852	.370 0389	.343 311	.426 5610
.803	.348 7985	.230 428	.447 9830	.853	.370 4832	.344 626	.426 1346
.804	.349 2498	.231 761	.447 5352	.854	.370 9275	.345 941	.425 7087
0.805	0.349 6991	2.236 696	0.447 0870	0.855	0.371 3718	2.351 374	0.425 2832
.806	.350 1414	.232 031	.446 6411	.856	.371 8161	.347 229	.424 8581
.807	.350 5799	.233 171	.446 1966	.857	.372 2604	.348 682	.424 4335
.808	.351 0209	.234 417	.445 7527	.858	.372 7047	.349 839	.424 0093
.809	.351 4642	.235 661	.445 3081	.859	.373 1490	.350 799	.423 5855
0.810	0.351 9056	2.247 698	0.444 8681	0.860	0.373 5933	2.363 161	0.423 1621
.811	.352 3488	.236 937	.444 4311	.861	.374 0376	.351 545	.422 7391
.812	.352 7921	.238 198	.443 9948	.862	.374 4819	.352 892	.422 3166
.813	.353 2364	.239 462	.443 5585	.863	.374 9261	.353 991	.421 8945
.814	.353 6817	.240 728	.443 1222	.864	.375 3704	.354 632	.421 4728
0.815	0.354 1260	2.259 176	0.442 6833	0.865	0.375 8147	2.375 066	0.421 0516
.816	.354 5713	.241 436	.442 2461	.866	.376 2590	.357 352	.420 6307
.817	.355 0166	.242 699	.441 8099	.867	.376 7033	.358 701	.420 2103
.818	.355 4620	.243 963	.441 3731	.868	.377 1476	.359 842	.419 7903
.819	.355 9072	.245 230	.440 9373	.869	.377 5919	.361 243	.419 3707
0.820	0.356 3515	2.270 590	0.440 4917	0.870	0.377 9362	2.386 911	0.418 9515
.821	.356 7968	.247 271	.439 0464	.871	.378 3805	.362 399	.418 5328
.822	.357 2421	.248 535	.438 6017	.872	.378 8248	.363 689	.418 1145
.823	.357 6874	.249 802	.438 1573	.873	.379 2691	.364 682	.417 6966
.824	.358 1327	.251 069	.437 7134	.874	.379 7134	.365 478	.417 2791
0.825	0.358 5780	2.281 881	0.437 2680	0.875	0.380 1577	2.398 875	0.416 8620
.826	.359 0232	.251 661	.436 8230	.876	.380 6020	.367 275	.416 4454
.827	.359 4685	.252 440	.436 3784	.877	.381 0463	.368 698	.416 0291
.828	.359 9138	.253 737	.435 9343	.878	.381 4906	.369 893	.415 6133
.829	.360 3591	.255 027	.435 4906	.879	.381 9349	.370 890	.415 1979
0.830	0.360 8044	2.293 319	0.435 0463	0.880	0.382 3791	2.410 900	0.414 7829
.831	.361 2497	.256 513	.434 6015	.881	.382 8234	.371 314	.414 3683
.832	.361 6950	.257 910	.434 1571	.882	.383 2677	.372 736	.413 9544
.833	.362 1403	.259 309	.433 7131	.883	.383 7120	.373 841	.413 5404
.834	.362 5856	.260 710	.433 2686	.884	.384 1563	.374 916	.413 1271
0.835	0.363 0309	2.304 814	0.432 8245	0.885	0.384 6006	2.422 981	0.412 7142
.836	.363 4762	.262 120	.432 3808	.886	.385 0449	.375 409	.412 3017
.837	.363 9215	.263 428	.431 9376	.887	.385 4892	.376 835	.411 8896
.838	.364 3668	.264 739	.431 4948	.888	.385 9335	.378 261	.411 4779
.839	.364 8121	.266 053	.431 0523	.889	.386 3778	.379 696	.411 0666
0.840	0.365 2574	2.316 367	0.430 6085	0.890	0.386 8221	2.435 130	0.410 6568
.841	.365 7027	.267 365	.430 1650	.891	.387 2664	.381 956	.410 2463
.842	.366 1480	.268 676	.429 7219	.892	.387 7107	.383 405	.409 8363
.843	.366 5933	.269 989	.429 2792	.893	.388 1550	.384 854	.409 4268
.844	.367 0386	.271 304	.428 8369	.894	.388 5993	.386 303	.409 0174
0.845	0.367 4839	2.327 978	0.428 3934	0.895	0.389 0436	2.447 336	0.408 6076
.846	.367 9292	.272 617	.427 9503	.896	.389 4879	.387 751	.408 1982
.847	.368 3745	.273 858	.427 5076	.897	.389 9322	.389 200	.407 7891
.848	.368 8198	.275 101	.427 0653	.898	.390 3765	.390 649	.407 3806
.849	.369 2651	.276 346	.426 6234	.899	.390 8208	.392 098	.406 9724
0.850	0.369 7104	2.339 647	0.426 1799	0.900	0.391 2651	2.459 603	0.406 5637
$\log_{10}(e^n)$	$\log_{10}(e^n)$	e^n	e^{-n}	$\log_{10}(e^n)$	$\log_{10}(e^n)$	e^n	e^{-n}

The Exponential.

x	$\log_{10}(e^x)$	e^x	e^{-x}	x	$\log_{10}(e^x)$	e^x	e^{-x}
0.000	0.300 8639	2.450 603	0.406 5697	0.080	0.412 5798	2.585 710	0.385 7410
.001	.301 4063	.402 664	.405 1033	.081	.413 0141	.585 207	.385 3345
.002	.301 7330	.404 547	.405 7573	.082	.413 4483	.590 886	.385 0083
.003	.302 1679	.406 903	.405 3518	.083	.413 8826	.593 478	.385 5825
.004	.302 6022	.409 461	.404 9466	.084	.414 3169	.595 973	.385 1071
0.005	0.303 0365	2.471 932	0.404 5470	0.085	0.414 7512	2.598 671	0.384 8121
.006	.303 4708	.474 405	.404 1375	.086	.415 1855	.601 271	.384 4875
.007	.303 9051	.476 881	.403 7336	.087	.415 6198	.603 873	.384 0133
.008	.304 3394	.479 359	.403 3304	.088	.416 0541	.606 478	.383 6594
.009	.304 7737	.481 839	.402 9269	.089	.416 4884	.609 086	.383 2760
0.010	0.305 2080	2.484 323	0.402 5242	0.090	0.416 9227	2.611 696	0.382 8939
.011	.305 6423	.486 808	.402 1219	.091	.417 3570	.614 309	.382 5102
.012	.306 0766	.489 295	.401 7200	.092	.417 7913	.616 925	.382 1270
.013	.306 5109	.491 787	.401 3185	.093	.418 2256	.619 543	.381 7450
.014	.306 9452	.494 280	.400 9173	.094	.418 6599	.622 164	.381 3644
0.015	0.307 3795	2.496 775	0.400 5166	0.095	0.419 0942	2.624 788	0.380 9832
.016	.307 8137	.499 273	.400 1163	.096	.419 5285	.627 414	.380 6024
.017	.308 2480	.501 774	.399 7164	.097	.419 9628	.630 042	.380 2220
.018	.308 6823	.504 277	.399 3169	.098	.420 3971	.632 674	.379 8420
.019	.309 1166	.506 782	.398 9178	.099	.420 8314	.635 308	.379 4623
0.020	0.309 5509	2.509 290	0.398 5190	0.090	0.421 2657	2.637 944	0.379 0830
.021	.309 9852	.511 801	.398 1202	.091	.421 6999	.640 584	.378 7041
.022	.400 4195	.514 314	.397 7228	.092	.422 1342	.643 226	.378 3256
.023	.400 8538	.516 830	.397 3253	.093	.422 5685	.645 870	.377 9475
.024	.401 2881	.519 348	.396 9281	.094	.423 0028	.648 517	.377 5697
0.025	0.401 7224	2.521 868	0.396 5314	0.095	0.423 4371	2.651 167	0.377 1924
.026	.402 1567	.524 391	.396 1351	.096	.423 8714	.653 820	.376 8153
.027	.402 5910	.526 917	.395 7391	.097	.424 3057	.656 475	.376 4387
.028	.403 0253	.529 445	.395 3436	.098	.424 7400	.659 131	.376 0625
.029	.403 4596	.531 975	.394 9485	.099	.425 1743	.661 793	.375 6866
0.030	0.403 8939	2.534 509	0.394 5537	0.080	0.425 6086	2.664 496	0.375 3111
.031	.404 3282	.537 045	.394 1594	.081	.426 0429	.667 122	.374 9360
.032	.404 7625	.539 583	.393 7654	.082	.426 4772	.669 790	.374 5612
.033	.405 1968	.542 124	.393 3718	.083	.426 9115	.672 469	.374 1860
.034	.405 6310	.544 668	.392 9786	.084	.427 3458	.675 135	.373 8129
0.035	0.406 0653	2.547 213	0.392 5850	0.085	0.427 7801	2.677 812	0.373 4392
.036	.406 4996	.549 762	.392 1933	.086	.428 2144	.680 491	.373 0660
.037	.406 9339	.552 313	.391 8015	.087	.428 6487	.683 173	.372 6931
.038	.407 3682	.554 867	.391 4099	.088	.429 0829	.685 857	.372 3206
.039	.407 8025	.557 423	.391 0187	.089	.429 5172	.688 545	.371 9485
0.040	0.408 2368	2.559 681	0.390 6268	0.090	0.429 9515	2.691 234	0.371 5767
.041	.408 6711	.562 243	.390 2374	.091	.430 3858	.693 927	.371 2053
.042	.409 1054	.564 807	.389 8474	.092	.430 8201	.696 622	.370 8343
.043	.409 5397	.567 373	.389 4577	.093	.431 2544	.699 320	.370 4636
.044	.409 9740	.570 242	.389 0684	.094	.431 6887	.702 021	.370 0934
0.045	0.410 4083	2.572 813	0.388 6796	0.095	0.432 1230	2.704 736	0.369 7234
.046	.410 8426	.575 387	.388 2911	.096	.432 5573	.707 430	.369 3530
.047	.411 2769	.577 964	.387 9030	.097	.432 9916	.710 130	.368 9847
.048	.411 7112	.580 543	.387 5153	.098	.433 4259	.712 831	.368 6159
.049	.412 1455	.583 125	.387 1280	.099	.433 8602	.715 535	.368 2475
0.050	0.412 5798	2.585 710	0.386 7430	1.000	0.434 2945	2.718 282	0.367 8794
$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}	$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}

SMITHSONIAN TABLES

The Exponential.

n	$\log_e(n^2)$	e^n	e^{-n}	n	$\log_e(n^2)$	e^n	e^{-n}
1.000	0.431 2015	2.718 282	0.367 8794	1.030	0.455 0002	2.857 651	0.340 0377
1.001	0.434 7288	2.721 001	0.367 5117	1.051	0.459 4435	2.911 510	0.340 3880
1.002	0.438 1031	2.723 724	0.367 1444	1.052	0.459 8778	2.913 372	0.340 2386
1.003	0.441 5074	2.726 449	0.366 7775	1.053	0.459 3121	2.915 237	0.340 0895
1.004	0.444 9317	2.729 177	0.366 4109	1.054	0.459 7464	2.917 105	0.340 5408
1.005	0.448 3860	2.731 907	0.366 0446	1.055	0.459 1807	2.918 975	0.340 1924
1.006	0.451 8602	2.734 641	0.365 6788	1.056	0.459 6150	2.921 849	0.340 8444
1.007	0.455 3545	2.737 377	0.365 3133	1.057	0.459 0493	2.924 725	0.340 4967
1.008	0.458 8688	2.739 115	0.364 9481	1.058	0.459 4836	2.927 604	0.340 1494
1.009	0.462 4031	2.741 857	0.364 5831	1.059	0.459 9179	2.930 481	0.340 8024
1.010	0.465 9574	2.744 601	0.364 2189	1.060	0.460 3522	2.933 361	0.340 4558
1.011	0.469 5317	2.747 348	0.363 8549	1.061	0.460 7864	2.936 250	0.340 1095
1.012	0.473 1260	2.750 098	0.363 4913	1.062	0.461 2207	2.939 150	0.340 7630
1.013	0.476 7403	2.752 850	0.363 1280	1.063	0.461 6550	2.942 063	0.340 4168
1.014	0.480 3746	2.755 605	0.362 7659	1.064	0.462 0893	2.944 980	0.340 0708
1.015	0.484 0289	2.758 363	0.362 4021	1.065	0.462 5236	2.947 900	0.340 7279
1.016	0.487 6032	2.761 124	0.362 0382	1.066	0.462 9579	2.950 821	0.340 3833
1.017	0.491 1975	2.763 888	0.361 6753	1.067	0.463 3922	2.953 745	0.340 0391
1.018	0.494 8118	2.766 651	0.361 3129	1.068	0.463 8265	2.956 673	0.340 6959
1.019	0.498 4461	2.769 421	0.360 9507	1.069	0.464 2608	2.959 600	0.340 3517
1.020	0.502 1004	2.772 195	0.360 5889	1.070	0.464 6951	2.962 530	0.340 0085
1.021	0.505 7747	2.774 972	0.360 2265	1.071	0.465 1294	2.965 465	0.340 6657
1.022	0.509 4690	2.777 752	0.359 8645	1.072	0.465 5637	2.968 406	0.340 3234
1.023	0.513 1833	2.780 537	0.359 5028	1.073	0.465 9980	2.971 351	0.340 9810
1.024	0.516 9175	2.783 316	0.359 1411	1.074	0.466 4323	2.974 301	0.340 6394
1.025	0.520 6718	2.786 095	0.358 7795	1.075	0.466 8666	2.977 250	0.340 2978
1.026	0.524 4461	2.788 881	0.358 4178	1.076	0.467 3009	2.980 202	0.340 9566
1.027	0.528 2404	2.791 675	0.358 0560	1.077	0.467 7352	2.983 159	0.340 6158
1.028	0.532 0547	2.794 476	0.357 6947	1.078	0.468 1695	2.986 120	0.340 2754
1.029	0.535 8890	2.797 286	0.357 3331	1.079	0.468 6037	2.989 087	0.340 9355
1.030	0.539 7433	2.800 096	0.356 9710	1.080	0.469 0380	2.992 050	0.340 5955
1.031	0.543 5176	2.802 908	0.356 6091	1.081	0.469 4723	2.995 020	0.340 2561
1.032	0.547 3119	2.805 724	0.356 2472	1.082	0.469 9066	2.998 000	0.340 9170
1.033	0.551 1262	2.808 542	0.355 8855	1.083	0.470 3409	2.999 985	0.340 5783
1.034	0.554 9605	2.811 363	0.355 5238	1.084	0.470 7752	3.002 980	0.340 2399
1.035	0.558 8148	2.814 185	0.355 1624	1.085	0.471 2095	3.005 980	0.340 9018
1.036	0.562 6891	2.817 007	0.354 8013	1.086	0.471 6438	3.008 985	0.340 5641
1.037	0.566 5834	2.819 831	0.354 4404	1.087	0.472 0781	3.011 995	0.340 2267
1.038	0.570 4977	2.822 656	0.354 0797	1.088	0.472 5124	3.014 995	0.340 8896
1.039	0.574 4320	2.825 482	0.353 7191	1.089	0.472 9467	3.017 995	0.340 5520
1.040	0.578 3863	2.828 309	0.353 3587	1.090	0.473 3810	3.020 995	0.340 2165
1.041	0.582 3606	2.831 137	0.352 9984	1.091	0.473 8153	3.023 995	0.340 8804
1.042	0.586 3549	2.833 966	0.352 6382	1.092	0.474 2496	3.026 995	0.340 5447
1.043	0.590 3692	2.836 797	0.352 2781	1.093	0.474 6839	3.029 995	0.340 2094
1.044	0.594 4035	2.839 629	0.351 9181	1.094	0.475 1182	3.032 995	0.340 8743
1.045	0.598 4578	2.842 463	0.351 5582	1.095	0.475 5525	3.035 995	0.340 5396
1.046	0.602 5321	2.845 300	0.351 1984	1.096	0.475 9868	3.038 995	0.340 2052
1.047	0.606 6264	2.848 139	0.350 8387	1.097	0.476 4211	3.041 995	0.340 8717
1.048	0.610 7407	2.850 981	0.350 4791	1.098	0.476 8554	3.044 995	0.340 5375
1.049	0.614 8750	2.853 825	0.350 1197	1.099	0.477 2897	3.047 995	0.340 2041
1.050	0.619 0293	2.856 671	0.349 7607	1.100	0.477 7240	3.050 995	0.340 8711
$\log_e(e^2)$	$\log_e(e^3)$	e^4	e^{-4}	$\log_e(e^4)$	$\log_e(e^5)$	e^6	e^{-6}

The Exponential.

u	$\log_e(u^2)$	e^u	e^{-u}	u	$\log_e(u^2)$	e^u	e^{-u}
1.100	0.477 7239	3.004 166	0.332 8711	1.130	0.499 4387	3.158 193	0.316 6368
.101	.478 1512	.007 172	.331 5384	.131	.499 8729	.101 353	.316 3203
.102	.478 5925	.010 180	.330 2056	.132	.500 3072	.104 516	.316 0011
.103	.479 0268	.013 192	.331 8740	.133	.500 7415	.107 682	.315 6833
.104	.479 4511	.016 207	.331 5423	.134	.501 1758	.110 851	.315 3728
1.105	0.479 8854	3.019 224	0.331 2109	1.135	0.501 6101	3.174 023	0.315 0575
.106	.480 3207	.022 245	.330 8798	.136	.502 0444	.117 199	.314 7420
.107	.480 7610	.025 269	.330 5491	.137	.502 4787	.120 378	.314 4281
.108	.481 1953	.028 290	.330 2187	.138	.502 9130	.123 560	.314 1137
.109	.481 6336	.031 326	.329 8887	.139	.503 3473	.126 745	.313 7998
1.110	0.482 0669	3.034 358	0.329 5590	1.140	0.503 7816	3.189 033	0.313 4862
.111	.482 5012	.037 394	.329 2296	.141	.504 2159	.131 125	.313 1730
.112	.482 9355	.040 413	.328 9005	.142	.504 6502	.134 320	.312 8598
.113	.483 3698	.043 475	.328 5718	.143	.505 0845	.137 517	.312 5471
.114	.483 8041	.046 520	.328 2434	.144	.505 5188	.140 719	.312 2347
1.115	0.484 2383	3.049 568	0.327 9153	1.145	0.505 9531	3.205 923	0.311 9227
.116	.484 6726	.052 619	.327 5875	.146	.506 3874	.143 921	.311 6109
.117	.485 1069	.055 673	.327 2601	.147	.506 8217	.147 124	.311 3004
.118	.485 5412	.058 731	.326 9330	.148	.507 2560	.150 335	.310 9908
.119	.485 9755	.061 791	.326 6062	.149	.507 6902	.153 546	.310 6775
1.120	0.486 4098	3.064 854	0.326 2798	1.150	0.508 1245	3.221 003	0.310 3660
.121	.486 8441	.067 821	.325 9537	.151	.508 5588	.156 216	.310 0569
.122	.487 2784	.070 909	.325 6279	.152	.508 9931	.159 443	.309 7498
.123	.487 7127	.074 001	.325 3024	.153	.509 4274	.162 673	.309 4432
.124	.488 1470	.077 138	.324 9773	.154	.509 8617	.165 903	.309 1380
1.125	0.488 5813	3.080 217	0.324 6525	1.155	0.510 2960	3.238 143	0.308 8300
.125	.489 0156	.083 299	.324 3280	.156	.510 7303	.171 385	.308 5203
.127	.489 4499	.086 383	.324 0038	.157	.511 1646	.174 625	.308 2080
.128	.489 8842	.089 471	.323 6800	.158	.511 5989	.177 869	.307 8939
.129	.490 3185	.092 562	.323 3565	.159	.512 0332	.181 121	.307 5852
1.130	0.490 7528	3.095 637	0.323 0333	1.160	0.512 4675	3.254 374	0.307 2787
.131	.491 1871	.095 754	.322 7104	.161	.512 9018	.184 370	.306 9716
.132	.491 6214	.101 854	.322 3878	.162	.513 3361	.187 620	.306 6638
.133	.492 0556	.104 957	.322 0656	.163	.513 7704	.190 871	.306 3583
.134	.492 4899	.108 064	.321 7437	.164	.514 2047	.194 128	.306 0521
1.135	0.492 9242	3.111 174	0.321 4221	1.165	0.514 6390	3.270 687	0.305 7462
.135	.493 3585	.114 286	.321 1009	.166	.515 0733	.197 389	.305 4406
.137	.493 7928	.117 408	.320 7799	.167	.515 5076	.200 693	.305 1353
.138	.494 2271	.120 521	.320 4593	.168	.515 9418	.203 998	.304 8303
.139	.494 6614	.123 643	.320 1390	.169	.516 3761	.207 305	.304 5256
1.140	0.495 0957	3.126 768	0.319 8190	1.170	0.516 8104	3.287 081	0.304 2213
.141	.495 5300	.126 807	.319 4994	.171	.517 2447	.210 600	.303 9172
.142	.495 9643	.133 028	.319 1800	.172	.517 6790	.213 902	.303 6134
.143	.496 3986	.136 163	.318 8610	.173	.518 1133	.217 207	.303 3100
.144	.496 8329	.139 300	.318 5423	.174	.518 5476	.220 515	.303 0068
1.145	0.497 2672	3.142 441	0.318 2230	1.175	0.518 9819	3.303 528	0.302 7040
.145	.497 7015	.145 385	.317 9050	.176	.519 4162	.223 803	.302 4014
.147	.498 1358	.148 733	.317 5881	.177	.519 8505	.227 111	.302 0999
.148	.498 5701	.151 883	.317 2707	.178	.520 2848	.230 421	.301 7972
.149	.499 0044	.155 030	.316 9536	.179	.520 7191	.233 733	.301 4955
1.150	0.499 4387	3.158 103	0.316 6368	1.200	0.521 1534	3.320 117	0.301 1942
$\log_e(u^2)$	$\log_e(u^2)$	e^u	e^{-u}	$\log_e(u^2)$	$\log_e(u^2)$	e^u	e^{-u}

SMITHSONIAN TABLES

The Exponential.

x	$\log_{10}(e^x)$	e^x	e^{-x}	x	$\log_{10}(e^x)$	e^x	e^{-x}
1.200	0.521 1534	3.320 117	0.301 1942	1.250	0.542 8081	3.490 313	0.285 5048
1.201	521 5977	333 430	300 8932	1.251	543 3024	350 2184	286 2184
1.202	522 0420	334 761	300 5924	1.252	543 7967	351 331	285 9324
1.203	522 4863	335 092	300 2920	1.253	544 2910	352 440	285 6466
1.204	522 9306	335 421	299 9918	1.254	544 6953	353 542	285 3611
1.205	523 3749	335 750	0.299 6920	1.255	545 0996	354 648	0.285 0768
1.206	523 8192	336 078	299 3925	1.256	545 5039	355 751	284 7909
1.207	524 2635	336 407	299 0932	1.257	545 9082	356 851	284 5053
1.208	524 7078	336 735	298 7943	1.258	546 3125	357 958	284 2210
1.209	525 1521	337 063	298 4959	1.259	546 7168	359 061	283 9378
1.210	525 5964	337 392	0.298 1973	1.260	547 1211	360 168	0.283 6549
1.211	526 0407	337 720	297 8984	1.261	547 5253	361 270	283 3705
1.212	526 4850	338 048	297 6005	1.262	547 9296	362 370	283 0873
1.213	526 9293	338 376	297 3030	1.263	548 3339	363 471	282 8043
1.214	527 3736	338 704	297 0069	1.264	548 7382	364 571	282 5217
1.215	527 8179	339 032	0.296 7086	1.265	549 1425	365 671	0.282 2398
1.216	528 2622	339 360	296 4135	1.266	549 5468	366 771	281 9572
1.217	528 7065	339 688	296 1177	1.267	549 9511	367 871	281 6754
1.218	529 1508	340 016	295 8212	1.268	550 3554	368 971	281 3938
1.219	529 5951	340 344	295 5255	1.269	550 7597	369 071	281 1126
1.220	530 0394	340 672	0.295 2302	1.270	551 1640	370 171	0.280 8316
1.221	530 4837	341 000	294 9351	1.271	551 5683	371 271	280 5509
1.222	530 9280	341 328	294 6403	1.272	551 9726	372 371	280 2705
1.223	531 3723	341 656	294 3458	1.273	552 3769	373 471	279 9904
1.224	531 8166	341 984	294 0516	1.274	552 7812	374 571	279 7103
1.225	532 2609	342 312	0.293 7577	1.275	553 1855	375 671	0.279 4310
1.226	532 7052	342 640	293 4641	1.276	553 5898	376 771	279 1517
1.227	533 1495	342 968	293 1708	1.277	553 9941	377 871	278 8727
1.228	533 5938	343 296	292 8777	1.278	554 3984	378 971	278 5939
1.229	534 0381	343 624	292 5850	1.279	554 8027	380 071	278 3155
1.230	534 4824	343 952	0.292 2926	1.280	555 2070	381 171	0.278 0373
1.231	534 9267	344 280	292 0003	1.281	555 6113	382 271	277 7594
1.232	535 3710	344 608	291 7086	1.282	556 0156	383 371	277 4818
1.233	535 8153	344 936	291 4170	1.283	556 4199	384 471	277 2044
1.234	536 2596	345 264	291 1257	1.284	556 8242	385 571	276 9274
1.235	536 7039	345 592	0.290 8341	1.285	557 2285	386 671	0.276 6505
1.236	537 1482	345 920	290 5421	1.286	557 6328	387 771	276 3741
1.237	537 5925	346 248	290 2507	1.287	558 0371	388 871	276 0978
1.238	538 0368	346 576	289 9596	1.288	558 4414	389 971	275 8219
1.239	538 4811	346 904	289 6687	1.289	558 8457	391 071	275 5462
1.240	538 9254	347 232	0.290 3782	1.290	559 2500	392 171	0.275 2708
1.241	539 3697	347 560	290 0869	1.291	559 6543	393 271	274 9955
1.242	539 8140	347 888	289 7960	1.292	560 0586	394 371	274 7208
1.243	540 2583	348 216	289 5053	1.293	560 4629	395 471	274 4462
1.244	540 7026	348 544	289 2150	1.294	560 8672	396 571	274 1719
1.245	541 1469	348 872	0.289 9251	1.295	561 2715	397 671	0.273 8979
1.246	541 5912	349 200	289 6351	1.296	561 6758	398 771	273 6241
1.247	542 0355	349 528	289 3456	1.297	562 0801	399 871	273 3507
1.248	542 4798	349 856	289 0564	1.298	562 4844	400 971	273 0774
1.249	542 9241	350 184	288 7674	1.299	562 8887	402 071	272 8043
1.250	0.512 8081	3.490 343	0.285 5048	1.300	0.564 5828	3.689 257	0.273 5318
$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}	$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}

The Exponential.

x	$\log_{10}(e^x)$	e^x	e^{-x}	x	$\log_{10}(e^x)$	e^x	e^{-x}
1.300	0.561 5828	3.669 297	0.272 5318	1.330	0.586 2076	3.857 426	0.259 2403
1.301	.562 0171	.672 068	.272 2594	1.331	.586 7318	.861 285	.258 9811
1.302	.562 4514	.676 643	.271 9873	1.332	.587 2561	.865 148	.258 7223
1.303	.562 8857	.680 321	.271 7154	1.333	.587 7804	.869 015	.258 4637
1.304	.563 3200	.684 003	.271 4438	1.334	.588 3047	.872 886	.258 2054
1.305	0.563 7543	3.687 680	0.271 1725	1.335	0.588 8290	3.876 761	0.257 9473
1.306	.564 1886	.691 379	.270 9015	1.336	.588 8533	.880 640	.257 6895
1.307	.564 6229	.695 072	.270 6307	1.337	.589 3776	.884 522	.257 4319
1.308	.565 0572	.698 769	.270 3603	1.338	.589 7719	.888 400	.257 1746
1.309	.565 4915	.702 469	.270 0900	1.339	.590 2062	.892 289	.256 9176
1.310	0.565 9258	3.706 174	0.269 8201	1.360	0.590 6405	3.896 193	0.256 6608
1.311	.566 3601	.706 862	.269 5504	1.361	.591 0748	.900 091	.256 4042
1.312	.566 7944	.711 563	.269 2810	1.362	.591 5091	.903 993	.256 1480
1.313	.567 2287	.716 309	.269 0118	1.363	.591 9434	.907 890	.255 8919
1.314	.567 6630	.721 068	.268 7429	1.364	.592 3777	.911 809	.255 6364
1.315	0.567 0972	3.724 751	0.268 4743	1.365	0.592 8120	3.915 723	0.255 3807
1.316	.567 5315	.728 478	.268 2060	1.366	.593 2463	.919 641	.255 1254
1.317	.567 9658	.732 208	.267 9379	1.367	.593 6806	.923 564	.254 8704
1.318	.568 4001	.735 942	.267 6701	1.368	.594 1149	.927 488	.254 6157
1.319	.568 8344	.739 680	.267 4026	1.369	.594 5491	.931 417	.254 3612
1.320	0.569 2687	3.743 481	0.267 1353	1.370	0.594 9834	3.935 351	0.254 1070
1.321	.569 7030	.747 167	.266 8683	1.371	.595 4177	.935 288	.253 8530
1.322	.569 1373	.750 905	.266 6016	1.372	.595 8520	.943 240	.253 5993
1.323	.569 5716	.754 660	.266 3351	1.373	.596 2863	.947 174	.253 3458
1.324	.569 0059	.758 425	.266 0689	1.374	.596 7206	.951 124	.253 0926
1.325	0.569 4402	3.762 185	0.265 8030	1.375	0.597 1549	3.955 077	0.252 8396
1.326	.569 8745	.762 949	.265 5373	1.376	.597 5892	.959 034	.252 5869
1.327	.570 3088	.766 717	.265 2719	1.377	.598 0235	.962 995	.252 3344
1.328	.570 7431	.770 489	.265 0067	1.378	.598 4578	.966 960	.252 0822
1.329	.571 1774	.774 264	.264 7419	1.379	.598 8921	.970 929	.251 8303
1.330	0.571 6117	3.781 613	0.264 4773	1.380	0.599 3264	3.974 602	0.251 5786
1.331	.572 0460	.784 826	.264 2129	1.381	.599 7607	.978 870	.251 3271
1.332	.572 4802	.788 613	.263 9488	1.382	.600 1950	.982 839	.251 0759
1.333	.572 9145	.792 404	.263 6850	1.383	.600 6293	.986 814	.250 8249
1.334	.573 3488	.796 198	.263 4215	1.384	.601 0636	.990 833	.250 5742
1.335	0.573 7831	3.790 906	0.263 1582	1.385	0.601 4979	3.994 826	0.250 3238
1.336	.574 2174	.803 708	.262 8951	1.386	.601 9322	.998 823	.250 0736
1.337	.574 6517	.807 604	.262 6324	1.387	.602 3665	4.002 824	.249 8237
1.338	.575 0860	.811 473	.262 3700	1.388	.602 8007	.996 838	.249 5740
1.339	.575 5203	.815 226	.262 1076	1.389	.603 2350	.996 837	.249 3245
1.340	0.575 9546	3.819 044	0.261 8457	1.390	0.603 6693	4.014 890	0.249 0753
1.341	.576 3889	.822 864	.261 5840	1.391	.604 1036	.998 807	.248 8264
1.342	.576 8232	.826 689	.261 3225	1.392	.604 5379	.992 888	.248 5777
1.343	.577 2575	.830 518	.261 0613	1.393	.604 9722	.996 913	.248 3292
1.344	.577 6918	.834 350	.260 8004	1.394	.605 4065	.996 942	.248 0810
1.345	0.578 1261	3.838 187	0.260 5397	1.395	0.605 8408	4.034 973	0.247 8330
1.346	.578 5604	.842 027	.260 2793	1.396	.606 2751	.999 012	.247 5851
1.347	.578 9947	.845 871	.260 0191	1.397	.606 7094	.993 053	.247 3379
1.348	.579 4290	.849 718	.259 7593	1.398	.607 1437	.997 098	.247 0907
1.349	.579 8633	.853 570	.259 4996	1.399	.607 5780	.991 147	.246 8437
1.350	0.580 2976	3.857 426	0.259 2403	1.400	0.608 0123	4.055 200	0.246 5970
$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}	$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}

The Exponential.

u	$\log_e(u^b)$	e^u	e^{-u}	u	$\log_e(u^b)$	e^u	e^{-u}
1.400	0.608 0123	4.055 200	0.246 5970	1.450	0.629 7270	4.263 115	0.234 5703
.401	.608 4466	.009 257	.246 3595	.451	.630 1613	.267 380	.234 3338
.402	.608 8809	.009 318	.246 1043	.452	.630 5956	.271 640	.234 1016
.403	.609 3152	.007 384	.245 8583	.453	.631 0300	.275 903	.233 8676
.404	.609 7495	.007 453	.245 6125	.454	.631 4642	.280 201	.233 6330
1.405	0.610 1837	4.075 527	0.245 3671	1.455	0.631 8985	4.284 493	0.233 4004
.406	.610 6180	.070 604	.245 1218	.456	.632 3328	.288 770	.233 1671
.407	.611 0523	.083 686	.244 8768	.457	.632 7671	.293 061	.232 9340
.408	.611 4866	.087 772	.244 6321	.458	.633 2014	.297 356	.232 7012
.409	.611 9209	.091 861	.244 3875	.459	.633 6356	.301 656	.232 4680
1.410	0.612 3552	4.095 955	0.244 1433	1.460	0.634 0699	4.305 960	0.232 2363
.411	.612 7895	.100 053	.243 8993	.461	.634 5042	.310 268	.232 0042
.412	.613 2238	.104 156	.243 6555	.462	.634 9385	.314 580	.231 7723
.413	.613 6581	.108 262	.243 4120	.463	.635 3728	.318 897	.231 5406
.414	.614 0924	.112 372	.243 1687	.464	.635 8071	.323 218	.231 3092
1.415	0.614 5267	4.116 486	0.242 9256	1.465	0.636 2414	4.327 543	0.231 0780
.416	.614 9610	.120 605	.242 6828	.466	.636 6757	.327 573	.230 8470
.417	.615 3953	.124 728	.242 4402	.467	.637 1100	.332 207	.230 6163
.418	.615 8296	.128 854	.242 1979	.468	.637 5443	.336 545	.230 3869
.419	.616 2639	.132 985	.241 9550	.469	.637 9786	.340 888	.230 1555
1.420	0.616 6982	4.137 120	0.241 7140	1.470	0.638 4129	4.349 235	0.229 9255
.421	.617 1325	.141 260	.241 4724	.471	.638 8472	.353 587	.229 6957
.422	.617 5668	.145 403	.241 2311	.472	.639 2815	.357 942	.229 4661
.423	.617 0010	.149 550	.240 9900	.473	.639 7158	.362 302	.229 2376
.424	.618 4353	.153 702	.240 7494	.474	.640 1501	.366 667	.229 0096
1.425	0.618 8696	4.157 858	0.240 5085	1.475	0.640 5844	4.371 035	0.228 7787
.426	.619 3039	.157 918	.240 2681	.476	.641 0187	.375 459	.228 5501
.427	.619 7382	.162 082	.240 0279	.477	.641 4530	.379 787	.228 3216
.428	.620 1725	.170 350	.239 7880	.478	.641 8872	.384 169	.228 0934
.429	.620 6068	.174 523	.239 5484	.479	.642 3215	.388 555	.227 8654
1.430	0.621 0411	4.178 690	0.239 3080	1.480	0.642 7558	4.392 946	0.227 6377
.431	.621 4754	.182 880	.239 0697	.481	.643 1901	.397 341	.227 4102
.432	.621 9097	.187 055	.238 8308	.482	.643 6244	.401 740	.227 1829
.433	.622 3440	.191 254	.238 5921	.483	.644 0587	.406 144	.226 9568
.434	.622 7783	.195 447	.238 3536	.484	.644 4930	.410 553	.226 7309
1.435	0.623 2126	4.199 645	0.238 1154	1.485	0.644 9273	4.414 965	0.226 5023
.436	.623 6469	.202 847	.237 8774	.486	.645 3616	.419 383	.226 2760
.437	.624 0812	.208 053	.237 6396	.487	.645 7959	.423 804	.226 0508
.438	.624 5155	.212 263	.237 4021	.488	.646 2302	.428 229	.225 8250
.439	.624 9498	.216 477	.237 1648	.489	.646 6645	.432 661	.225 5981
1.440	0.625 3841	4.220 696	0.236 9278	1.490	0.647 0988	4.437 096	0.225 3737
.441	.625 8183	.224 919	.236 6909	.491	.647 5331	.441 535	.225 1474
.442	.626 2526	.229 146	.236 4544	.492	.647 9674	.445 979	.224 9224
.443	.626 6869	.233 377	.236 2180	.493	.648 4017	.450 427	.224 6970
.444	.627 1212	.237 612	.235 9819	.494	.648 8360	.454 870	.224 4730
1.445	0.627 5555	4.241 852	0.235 7461	1.495	0.649 2703	4.450 337	0.224 2486
.446	.627 9898	.246 096	.235 5104	.496	.649 7046	.459 798	.224 0245
.447	.628 4241	.250 344	.235 2751	.497	.650 1388	.468 261	.223 8006
.448	.628 8584	.254 597	.235 0399	.498	.650 5731	.477 735	.223 5769
.449	.629 2927	.258 854	.234 8050	.499	.651 0074	.477 210	.223 3534
1.450	0.629 7270	4.263 115	0.234 5703	1.500	0.651 4417	4.481 680	0.223 1302
$\log_e(u^b)$	$\log_e(u^b)$	e^u	e^{-u}	$\log_e(u^b)$	$\log_e(u^b)$	e^u	e^{-u}

The Exponential.

x	$\log_e(x^x)$	e^x	e^{-x}	x	$\log_e(x^x)$	e^x	e^{-x}
1.900	0.651 4417	4.481 689	0.223 1302	1.550	0.673 1564	4.711 470	0.212 2480
1.901	.651 8760	.486 173	.222 6071	.551	.673 3007	.716 184	.212 0358
1.902	.652 3103	.480 661	.222 0843	.552	.674 0250	.720 903	.211 8239
1.903	.652 7446	.465 154	.221 4618	.553	.674 4903	.725 626	.211 6122
1.904	.653 1789	.460 552	.221 2304	.554	.674 8936	.730 354	.211 4007
1.905	0.653 6132	4.494 154	0.221 0173	1.555	0.675 3279	4.735 087	0.211 1894
1.906	.654 0475	.498 660	.221 7054	.556	.675 7622	.730 821	.210 9783
1.907	.654 4818	.513 171	.221 5737	.557	.676 1965	.744 566	.210 7674
1.908	.654 9161	.517 686	.221 3522	.558	.676 6308	.749 313	.210 5568
1.909	.655 3504	.522 206	.221 1310	.559	.677 0651	.754 065	.210 3463
1.910	0.655 7847	4.526 731	0.220 9100	1.560	0.677 4994	4.758 821	0.210 1361
1.911	.656 2190	.531 260	.220 6892	.561	.677 9337	.763 584	.209 9260
1.912	.656 6533	.535 793	.220 4686	.562	.678 3680	.768 348	.209 7162
1.913	.657 0876	.540 311	.220 2482	.563	.678 8023	.773 119	.209 5066
1.914	.657 5218	.544 874	.220 0281	.564	.679 2366	.777 895	.209 2972
1.915	0.657 9561	4.540 421	0.219 8082	1.565	0.679 6709	4.782 675	0.209 0880
1.916	.658 3904	.553 973	.219 5885	.566	.680 1052	.787 460	.208 8790
1.917	.658 8247	.558 520	.219 3690	.567	.680 5395	.792 250	.208 6703
1.918	.659 2590	.563 060	.219 1497	.568	.680 9737	.797 045	.208 4617
1.919	.659 6933	.567 655	.218 9307	.569	.681 4080	.801 844	.208 2533
1.920	0.660 1276	4.572 225	0.218 7110	1.570	0.681 8423	4.806 648	0.208 0452
1.921	.660 5619	.576 800	.218 4933	.571	.682 2766	.811 457	.207 8372
1.922	.660 9962	.581 370	.218 2749	.572	.682 7109	.816 271	.207 6295
1.923	.661 4305	.585 952	.218 0567	.573	.683 1452	.821 090	.207 4220
1.924	.661 8648	.590 551	.217 8388	.574	.683 5795	.825 913	.207 2147
1.925	0.662 2991	4.595 144	0.217 6211	1.575	0.684 0138	4.830 742	0.207 0076
1.926	.662 7334	.599 741	.217 4035	.576	.684 4481	.835 575	.206 8006
1.927	.663 1677	.604 343	.217 1859	.577	.684 8824	.840 413	.206 5939
1.928	.663 6020	.608 950	.216 9692	.578	.685 3167	.845 256	.206 3875
1.929	.664 0363	.613 561	.216 7523	.579	.685 7510	.850 103	.206 1812
1.930	0.664 4706	4.618 177	0.216 5357	1.580	0.686 1853	4.854 986	0.205 9751
1.931	.664 9049	.622 707	.216 3192	.581	.686 6196	.859 813	.205 7692
1.932	.665 3391	.627 232	.216 1030	.582	.687 0539	.864 675	.205 5636
1.933	.665 7734	.631 862	.215 8870	.583	.687 4882	.869 545	.205 3581
1.934	.666 2077	.636 487	.215 6713	.584	.687 9225	.874 413	.205 1528
1.935	0.666 6420	4.641 326	0.215 4557	1.585	0.688 3568	4.879 291	0.204 9478
1.936	.667 0763	.645 969	.215 2403	.586	.688 7910	.884 173	.204 7429
1.937	.667 5106	.650 617	.215 0252	.587	.689 2253	.889 060	.204 5383
1.938	.667 9449	.655 270	.214 8103	.588	.689 6596	.893 951	.204 3339
1.939	.668 3792	.659 928	.214 5956	.589	.690 0939	.898 848	.204 1296
1.940	0.668 8135	4.664 590	0.214 3811	1.590	0.690 5282	4.903 740	0.203 9256
1.941	.669 2478	.669 257	.214 1668	.591	.690 9625	.908 655	.203 7218
1.942	.669 6821	.673 929	.213 9528	.592	.691 3968	.913 566	.203 5182
1.943	.670 1164	.678 605	.213 7389	.593	.691 8311	.918 480	.203 3148
1.944	.670 5507	.683 283	.213 5253	.594	.692 2654	.923 403	.203 1115
1.945	0.670 9850	4.689 072	0.213 3119	1.595	0.692 6997	4.908 329	0.202 9085
1.946	.671 4193	.694 662	.213 0987	.596	.693 1340	.933 260	.202 7057
1.947	.671 8536	.699 337	.212 8857	.597	.693 5683	.938 195	.202 5031
1.948	.672 2879	.703 937	.212 6730	.598	.694 0026	.943 135	.202 3007
1.949	.672 7222	.708 701	.212 4603	.599	.694 4369	.948 082	.202 0985
1.950	0.673 1564	4.711 470	0.212 2480	1.600	0.694 8712	4.953 032	0.201 8965
$\log_e(x^x)$	$\log_e(x^x)$	e^x	e^{-x}	$\log_e(x^x)$	$\log_e(x^x)$	e^x	e^{-x}

The Exponential.

x	$\log_{10}(e^x)$	e^x	e^{-x}	x	$\log_{10}(e^x)$	e^x	e^{-x}
1.000	0.604 8712	4.053 032	0.201 8965	1.050	0.716 5899	5.206 980	0.192 0490
1.001	.605 3055	.957 988	.201 6647	1.051	.717 0302	.712 189	.191 8580
1.002	.605 7308	.958 048	.201 4331	1.052	.717 4715	.217 404	.191 6669
1.003	.606 1711	.959 014	.201 2017	1.053	.717 8888	.222 621	.191 4746
1.004	.606 6083	.959 884	.201 0005	1.054	.718 3131	.227 849	.191 2832
1.005	.607 0426	4.077 850	0.200 8896	1.055	0.718 7574	5.233 689	0.191 0921
1.006	.607 4769	.958 840	.200 6888	1.056	.719 1917	.238 316	.190 9011
1.007	.607 9112	.958 825	.200 4882	1.057	.719 6260	.243 557	.190 7103
1.008	.608 3455	.959 816	.200 2878	1.058	.720 0603	.248 803	.190 5196
1.009	.608 7798	.959 811	.200 0876	1.059	.720 4945	.254 051	.190 3292
1.010	0.609 2141	5.002 811	0.199 8876	1.060	0.720 9288	5.250 311	0.190 1390
1.011	.609 6484	.959 817	.199 6878	1.061	.721 3631	.264 573	.189 9480
1.012	.700 0827	.012 827	.199 4882	1.062	.721 7974	.269 830	.189 7591
1.013	.700 5170	.017 842	.199 2888	1.063	.722 2317	.275 112	.189 5694
1.014	.700 9513	.022 863	.199 0897	1.064	.722 6660	.280 399	.189 3799
1.015	0.701 3856	5.027 888	0.198 8907	1.065	0.723 1003	5.286 693	0.189 1907
1.016	.701 8199	.958 918	.198 6919	1.066	.723 5346	.290 691	.189 0016
1.017	.702 2542	.959 954	.198 4933	1.067	.723 9689	.296 255	.188 8127
1.018	.702 6885	.960 994	.198 2949	1.068	.724 4032	.301 554	.188 6239
1.019	.703 1228	.961 030	.198 0967	1.069	.724 8375	.306 858	.188 4354
1.020	0.703 5571	5.033 090	0.197 8987	1.070	0.725 2718	5.292 168	0.188 2471
1.021	.703 9914	.959 146	.197 7000	1.071	.725 7061	.317 483	.188 0589
1.022	.704 4259	.960 207	.197 5013	1.072	.726 1404	.322 803	.187 8700
1.023	.704 8602	.961 272	.197 3029	1.073	.726 5747	.328 128	.187 6812
1.024	.705 2944	.962 343	.197 1047	1.074	.727 0090	.333 459	.187 4926
1.025	0.705 7285	5.048 419	0.196 9117	1.075	0.727 4433	5.298 795	0.187 3042
1.026	.706 1628	.963 500	.196 7149	1.076	.727 8776	.344 137	.187 1210
1.027	.706 5971	.964 580	.196 5182	1.077	.728 3118	.349 483	.186 9379
1.028	.707 0314	.965 677	.196 3218	1.078	.728 7461	.354 830	.186 7547
1.029	.707 4657	.966 773	.196 1256	1.079	.729 1804	.360 183	.186 5664
1.030	0.707 9000	5.063 875	0.195 9296	1.080	0.729 6147	5.305 556	0.186 3749
1.031	.708 3343	.967 881	.195 7337	1.081	.730 0490	.370 624	.186 1877
1.032	.708 7686	.968 934	.195 5381	1.082	.730 4833	.376 208	.186 0016
1.033	.709 2029	.970 009	.195 3427	1.083	.730 9176	.381 677	.185 8157
1.034	.709 6372	.971 084	.195 1474	1.084	.731 3519	.387 061	.185 6300
1.035	0.710 0715	5.079 458	0.194 9524	1.085	0.731 7862	5.310 451	0.185 4444
1.036	.710 5058	.972 150	.194 7575	1.086	.732 2205	.392 846	.185 2591
1.037	.710 9401	.973 237	.194 5629	1.087	.732 6548	.398 207	.185 0739
1.038	.711 3744	.974 320	.194 3684	1.088	.733 0891	.403 633	.184 8889
1.039	.711 8087	.975 407	.194 1741	1.089	.733 5234	.409 064	.184 7041
1.040	0.712 2430	5.095 170	0.193 9800	1.090	0.733 9577	5.314 481	0.184 5195
1.041	.712 6773	.976 507	.193 7852	1.091	.734 3920	.414 503	.184 3351
1.042	.713 1115	.977 590	.193 5905	1.092	.734 8263	.420 331	.184 1509
1.043	.713 5458	.978 668	.193 3960	1.093	.735 2606	.426 204	.183 9668
1.044	.713 9801	.979 751	.193 2017	1.094	.735 6949	.432 202	.183 7829
1.045	0.714 4144	5.111 010	0.193 0126	1.095	0.736 1291	5.319 646	0.183 5998
1.046	.714 8487	.980 794	.192 8190	1.096	.736 5634	.438 095	.183 4157
1.047	.715 2830	.981 882	.192 6259	1.097	.737 0007	.444 250	.183 2324
1.048	.715 7173	.982 976	.192 4324	1.098	.737 4350	.450 010	.183 0493
1.049	.716 1516	.984 075	.192 2421	1.099	.737 8693	.456 476	.182 8663
1.050	0.716 5859	5.206 980	0.192 0490	1.100	0.738 3036	5.473 947	0.182 6835
$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}	$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}

The Exponential.

u	$\log_e(u^e)$	e^u	e^{-u}	u	$\log_e(u^e)$	e^u	e^{-u}
1.700	0.738 3006	5.473 947	0.183 6835	1.750	0.760 0153	5.754 603	0.173 7730
.701	.738 7340	.479 424	.183 5009	.751	.760 4405	.760 300	.173 0003
.702	.739 1692	.484 506	.183 3185	.752	.760 8659	.765 123	.173 4267
.703	.739 6035	.490 304	.183 1363	.753	.761 2912	.771 892	.173 2334
.704	.740 0378	.495 887	.182 9542	.754	.761 7175	.777 667	.173 0802
1.705	0.740 4721	5.501 386	0.182 7724	1.755	0.762 1438	5.783 448	0.172 9072
.706	.740 9064	.506 890	.182 5907	.756	.762 5691	.789 234	.172 7344
.707	.741 3407	.512 769	.182 4092	.757	.762 9954	.795 026	.172 5618
.708	.741 7750	.518 915	.182 2279	.758	.763 4217	.800 821	.172 3893
.709	.742 2093	.523 435	.182 0467	.759	.763 8480	.806 628	.172 2170
1.710	0.742 6436	5.528 961	0.181 8658	1.760	0.764 2743	5.812 437	0.172 0449
.711	.743 0779	.534 403	.181 6850	.761	.764 7006	.818 253	.171 8729
.712	.743 5122	.540 030	.181 5044	.762	.765 1269	.824 074	.171 7011
.713	.743 9464	.545 573	.181 3240	.763	.765 5532	.829 901	.171 5295
.714	.744 3807	.551 122	.181 1438	.764	.765 9795	.835 734	.171 3581
1.715	0.744 8150	5.556 676	0.180 9637	1.765	0.766 4058	5.841 572	0.171 1868
.716	.745 2493	.556 233	.180 7838	.766	.766 8321	.847 417	.171 0157
.717	.745 6836	.560 800	.180 6042	.767	.767 2584	.853 267	.170 8449
.718	.746 1179	.565 371	.180 4246	.768	.767 6847	.859 120	.170 6740
.719	.746 5522	.569 947	.180 2453	.769	.768 1110	.864 985	.170 5034
1.720	0.746 9865	5.584 528	0.180 0661	1.770	0.768 5373	5.870 853	0.170 3330
.721	.747 4208	.570 116	.179 8872	.771	.768 9636	.876 727	.170 1627
.722	.747 8551	.575 700	.179 7084	.772	.769 3899	.882 607	.170 0007
.723	.748 2894	.581 307	.179 5298	.773	.769 8162	.888 492	.169 8328
.724	.748 7237	.586 911	.179 3513	.774	.770 2425	.894 384	.169 6650
1.725	0.749 1580	5.612 521	0.179 1731	1.775	0.770 6688	5.900 381	0.169 4834
.726	.749 5923	.591 136	.178 9950	.776	.771 0951	.906 184	.169 3141
.727	.750 0266	.596 757	.178 8171	.777	.771 5214	.912 094	.169 1448
.728	.750 4609	.602 384	.178 6393	.778	.771 9477	.918 009	.168 9758
.729	.750 8952	.608 016	.178 4618	.779	.772 3740	.923 930	.168 8069
1.730	0.751 3295	5.640 654	0.178 2844	1.780	0.772 8003	5.909 896	0.168 6381
.731	.751 7638	.604 307	.178 1072	.781	.773 2266	.935 789	.168 4696
.732	.752 1980	.609 917	.177 9302	.782	.773 6529	.941 728	.168 3012
.733	.752 6323	.615 501	.177 7534	.783	.774 0792	.947 673	.168 1330
.734	.753 0666	.621 082	.177 5767	.784	.774 5055	.953 623	.167 9649
1.735	0.753 5009	5.668 928	0.177 4002	1.785	0.774 9318	5.939 580	0.167 7971
.736	.753 9352	.626 600	.177 2230	.786	.775 3581	.965 543	.167 6293
.737	.754 3695	.632 227	.177 0478	.787	.775 7844	.971 511	.167 4618
.738	.754 8038	.637 860	.176 8718	.788	.776 2107	.977 486	.167 2944
.739	.755 2381	.643 492	.176 6960	.789	.776 6370	.983 466	.167 1272
1.740	0.755 6724	5.697 343	0.176 5204	1.790	0.777 0633	5.989 452	0.166 9602
.741	.756 1067	.649 044	.176 3450	.791	.777 4896	.989 445	.166 7933
.742	.756 5410	.654 750	.176 1697	.792	.777 9159	6.001 443	.166 6266
.743	.756 9753	.660 361	.175 9946	.793	.778 3422	.997 448	.166 4600
.744	.757 4096	.665 972	.175 8197	.794	.778 7685	.013 458	.166 2937
1.745	0.757 8439	5.725 901	0.175 6450	1.795	0.779 1948	6.019 475	0.166 1275
.746	.758 2782	.671 630	.175 4704	.796	.779 6211	.999 407	.165 9614
.747	.758 7125	.677 305	.175 2960	.797	.780 0474	.021 526	.165 7955
.748	.759 1468	.682 985	.175 1218	.798	.780 4737	.997 400	.165 6298
.749	.759 5810	.688 651	.174 9478	.799	.780 8999	.023 601	.165 4643
1.750	0.760 0153	5.754 603	0.174 7739	1.800	0.781 3262	6.049 647	0.165 2989
$\log_e(u^e)$	$\log_e(u^e)$	e^u	e^{-u}	$\log_e(u^e)$	$\log_e(u^e)$	e^u	e^{-u}

SMITHSONIAN TABLES

The Exponential.

x	$\log_{10}(e^x)$	e^x	e^{-x}	x	$\log_{10}(e^x)$	e^x	e^{-x}
1.800	0.281 7301	6.039 647	0.165 2989	1.890	0.803 3448	6.399 820	0.157 2372
1.801	.281 8114	.605 790	.165 1337	1.891	.803 8791	.640 183	.157 0800
1.802	.281 8927	.606 799	.164 9686	1.892	.804 3134	.672 552	.156 9230
1.803	.281 9740	.607 812	.164 8037	1.893	.804 7477	.705 928	.156 7662
1.804	.282 0552	.607 825	.164 6390	1.894	.805 1820	.738 310	.156 6095
1.805	.282 1365	.6079 071	.164 4745	1.895	.805 6163	.6.391 698	.156 4529
1.806	.282 2178	.6085 051	.164 3101	1.896	.806 0506	.6.368 013	.156 2966
1.807	.282 2991	.6092 144	.164 1458	1.897	.806 4849	.6.404 021	.156 1403
1.808	.282 3804	.6098 230	.163 9818	1.898	.806 9191	.6.440 002	.155 9843
1.809	.282 4617	.6104 310	.163 8179	1.899	.807 3534	.6.477 316	.155 8281
1.810	.282 5430	.6.110 412	.163 6541	1.900	.807 7877	6.423 237	.155 6726
1.811	.282 6243	.6116 501	.163 4906	1.901	.808 2220	.6.460 111	.155 5170
1.812	.282 7056	.6122 681	.163 3272	1.902	.808 6563	.6.497 507	.155 3616
1.813	.282 7869	.6128 866	.163 1639	1.903	.809 0906	.6.535 237	.155 2063
1.814	.282 8682	.6135 038	.163 0008	1.904	.809 5249	.6.573 483	.155 0512
1.815	.282 9495	.6.141 076	.162 8379	1.905	.809 9592	6.611 936	.154 8962
1.816	.283 0308	.6147 220	.162 6752	1.906	.810 3935	.6.650 205	.154 7414
1.817	.283 1121	.6153 371	.162 5126	1.907	.810 8278	.6.688 281	.154 5867
1.818	.283 1934	.6159 547	.162 3501	1.908	.811 2621	.6.727 333	.154 4322
1.819	.283 2747	.6165 690	.162 1879	1.909	.811 6964	.6.766 311	.154 2779
1.820	.283 3560	.6.171 898	.162 0258	1.910	.812 1307	6.805 296	.154 1237
1.821	.283 4373	.6178 133	.161 8638	1.911	.812 5650	.6.844 288	.153 9696
1.822	.283 5186	.6184 215	.161 7020	1.912	.812 9993	.6.883 281	.153 8157
1.823	.283 5999	.6190 302	.161 5404	1.913	.813 4336	.6.922 277	.153 6620
1.824	.283 6812	.6196 305	.161 3789	1.914	.813 8679	.6.961 282	.153 5081
1.825	.283 7625	.6.202 795	.161 2176	1.915	.814 3022	6.520 819	.153 3539
1.826	.283 8438	.6208 001	.161 0565	1.916	.814 7365	.6.560 213	.153 2007
1.827	.283 9251	.6214 213	.160 8955	1.917	.815 1707	.6.600 284	.153 0486
1.828	.284 0064	.6220 431	.160 7347	1.918	.815 6050	.6.640 111	.152 8965
1.829	.284 0877	.6227 680	.160 5741	1.919	.816 0393	.6.680 055	.152 7448
1.830	.284 1690	6.233 887	.160 4136	1.920	.816 4736	6.720 205	.152 5921
1.831	.284 2503	.6240 121	.160 2532	1.921	.816 9079	.6.760 664	.152 4396
1.832	.284 3316	.6246 360	.160 0931	1.922	.817 3422	.6.801 281	.152 2872
1.833	.284 4129	.6252 616	.159 9339	1.923	.817 7765	.6.842 005	.152 1350
1.834	.284 4942	.6258 872	.159 7732	1.924	.818 2108	.6.882 771	.151 9830
1.835	.284 5755	6.265 134	.159 6135	1.925	.818 6451	6.923 584	.151 8301
1.836	.284 6568	.6271 602	.159 4540	1.926	.819 0794	.6.964 544	.151 6773
1.837	.284 7381	.6277 077	.159 2946	1.927	.819 5137	.6.995 540	.151 5247
1.838	.284 8194	.6283 558	.159 1354	1.928	.819 9480	.6.036 583	.151 3723
1.839	.284 9007	.6290 045	.158 9763	1.929	.820 3823	.6.077 573	.151 2200
1.840	.284 9820	6.296 338	.158 8174	1.930	.820 8166	6.619 360	.151 0678
1.841	.285 0633	.6302 838	.158 6587	1.931	.821 2509	.6.660 281	.150 9158
1.842	.285 1446	.6309 144	.158 5001	1.932	.821 6852	.6.701 281	.150 7639
1.843	.285 2259	.6315 451	.158 3417	1.933	.822 1195	.6.742 281	.150 6123
1.844	.285 3072	.6321 775	.158 1831	1.934	.822 5537	.6.783 281	.150 4607
1.845	.285 3885	6.328 100	.158 0253	1.935	.822 9880	6.824 281	.150 3083
1.846	.285 4698	.6334 431	.157 8674	1.936	.823 4223	.6.865 281	.150 1561
1.847	.285 5511	.6340 769	.157 7096	1.937	.823 8566	.6.906 281	.150 0040
1.848	.285 6324	.6347 113	.157 5520	1.938	.824 2909	.6.947 281	.149 8521
1.849	.285 7137	.6353 463	.157 3945	1.939	.824 7252	.6.988 281	.149 7003
1.850	0.803 4448	6.399 820	0.157 2372	1.900	0.825 1595	6.029 894	0.149 5486
$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}	$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}

The Exponential.

x	$\log_e(x^e)$	e^x	e^{-x}	x	$\log_e(x^e)$	e^x	e^{-x}
1.000	0.825 1395	6.085 834	0.149 5686	1.050	0.846 8742	7.028 688	0.142 2741
.991	.825 5038	.602 584	.149 4301	.051	.847 3085	.035 720	.142 1319
.992	.826 0281	.609 280	.149 3658	.052	.847 7428	.042 750	.141 9868
.993	.826 4624	.705 982	.149 1266	.053	.848 1771	.049 805	.141 8470
.994	.826 8967	.712 692	.148 9715	.054	.848 6114	.056 859	.141 7061
1.005	0.847 3310	6.719 408	0.148 8226	1.055	0.849 0457	7.663 919	0.141 5645
.995	.847 7653	.726 130	.148 6739	.055	.849 4800	.070 985	.141 4230
.997	.848 1996	.732 856	.148 5253	.057	.849 9143	.078 051	.141 2816
.998	.848 6339	.739 586	.148 3768	.058	.850 3486	.085 143	.141 1404
.999	.849 0682	.746 319	.148 2285	.059	.850 7829	.092 231	.140 9993
1.010	0.849 5025	6.753 089	0.148 0804	1.060	0.851 2172	7.000 337	0.140 8584
.911	.849 9368	.759 845	.147 9324	.061	.851 6515	.100 430	.140 7176
.912	.850 3710	.766 608	.147 7845	.062	.852 0858	.113 540	.140 5770
.913	.850 8053	.773 378	.147 6368	.063	.852 5201	.120 657	.140 4365
.914	.851 2396	.780 155	.147 4892	.064	.852 9544	.127 781	.140 2961
1.015	0.851 6739	6.786 030	0.147 3418	1.065	0.853 3887	7.134 913	0.140 1559
.916	.852 1082	.787 739	.147 1946	.066	.853 8230	.142 651	.140 0158
.917	.852 5425	.794 506	.147 0474	.067	.854 2572	.149 797	.139 8759
.918	.852 9768	.801 330	.146 9002	.068	.854 6915	.156 340	.139 7350
.919	.853 4111	.808 141	.146 7536	.069	.855 1258	.163 590	.139 5954
1.020	0.853 8454	6.820 968	0.146 6070	1.070	0.855 5601	7.170 696	0.139 4560
.921	.854 2797	.815 283	.146 4604	.071	.855 9944	.177 851	.139 3175
.922	.854 7140	.822 064	.146 3149	.072	.856 4287	.185 032	.139 1783
.923	.855 1483	.828 852	.146 1698	.073	.856 8630	.192 221	.139 0391
.924	.855 5826	.835 637	.146 0247	.074	.857 2973	.199 417	.138 9001
1.025	0.856 0169	6.855 149	0.145 8758	1.075	0.857 7316	7.206 620	0.138 7613
.926	.856 4512	.842 407	.145 7300	.076	.858 1659	.213 830	.138 6226
.927	.856 8855	.849 273	.145 5845	.077	.858 6002	.221 041	.138 4841
.928	.857 3198	.856 145	.145 4388	.078	.859 0345	.228 272	.138 3457
.929	.857 7541	.863 004	.145 2934	.079	.859 4688	.235 504	.138 2074
1.030	0.858 1884	6.889 580	0.145 1482	1.080	0.859 9031	7.242 743	0.138 0692
.931	.858 6226	.869 403	.145 0031	.081	.860 3374	.242 689	.137 9312
.932	.859 0569	.876 303	.144 8582	.082	.860 7717	.250 243	.137 7934
.933	.859 4912	.883 210	.144 7134	.083	.861 2060	.257 804	.137 6557
.934	.859 9255	.890 123	.144 5688	.084	.861 6403	.265 372	.137 5181
1.035	0.860 3598	6.924 041	0.144 4243	1.085	0.862 0745	7.279 047	0.137 3806
.936	.860 7941	.897 072	.144 2799	.086	.862 5088	.269 330	.137 2433
.937	.861 2284	.904 000	.144 1357	.087	.862 9431	.277 620	.137 1061
.938	.861 6627	.911 047	.143 9916	.088	.863 3774	.285 917	.136 9691
.939	.862 0970	.918 200	.143 8477	.089	.863 8117	.293 222	.136 8322
1.040	0.862 5313	6.958 751	0.143 7039	1.090	0.864 2460	7.315 534	0.136 6954
.941	.862 9656	.925 713	.143 5603	.091	.864 6803	.322 553	.136 5588
.942	.863 3999	.932 786	.143 4168	.092	.865 1146	.330 179	.136 4223
.943	.863 8342	.939 869	.143 2735	.093	.865 5489	.337 813	.136 2860
.944	.864 2685	.946 942	.143 1303	.094	.865 9832	.345 544	.136 1497
1.045	0.864 7028	6.993 632	0.142 9872	1.095	0.866 4175	7.352 203	0.136 0137
.946	.865 1371	.954 029	.142 8443	.096	.866 8518	.352 550	.135 8777
.947	.865 5714	.961 102	.142 7015	.097	.867 2861	.360 623	.135 7419
.948	.866 0057	.968 175	.142 5589	.098	.867 7204	.368 703	.135 6062
.949	.866 4399	.975 248	.142 4164	.099	.868 1547	.376 781	.135 4707
1.050	0.866 8742	7.028 688	0.142 2741	2.000	0.868 5890	7.389 056	0.135 3353
$\log_e(x^e)$	$\log_e(x^e)$	e^x	e^{-x}	$\log_e(x^e)$	$\log_e(x^e)$	e^x	e^{-x}

The Exponential.

x	$\log_{10}(e^x)$	e^x	e^{-x}	x	$\log_{10}(e^x)$	e^x	e^{-x}
2.000	0.868 5890	7.389 096	0.135 3353	2.050	0.870 3037	7.707 901	0.128 7349
2.001	0.869 0433	7.391 449	0.135 2000	2.051	0.870 7380	7.715 493	0.128 6662
2.002	0.869 4976	7.393 810	0.135 0640	2.052	0.871 1723	7.723 452	0.128 4777
2.003	0.869 9518	7.396 181	0.134 9289	2.053	0.871 6066	7.731 240	0.128 3483
2.004	0.870 4061	7.398 572	0.134 7939	2.054	0.872 0409	7.739 035	0.128 2210
2.005	0.870 8604	7.400 981	0.134 6603	2.055	0.872 4752	7.746 838	0.128 0928
2.006	0.871 3147	7.403 401	0.134 5257	2.056	0.872 9095	7.754 649	0.127 9648
2.007	0.871 7690	7.405 830	0.134 3912	2.057	0.873 3437	7.762 467	0.127 8369
2.008	0.872 2233	7.408 266	0.134 2569	2.058	0.873 7780	7.770 294	0.127 7091
2.009	0.872 6776	7.410 708	0.134 1227	2.059	0.874 2123	7.778 128	0.127 5815
2.010	0.873 1319	7.413 157	0.133 9887	2.060	0.874 6466	7.785 970	0.127 4539
2.011	0.873 5862	7.415 613	0.133 8548	2.061	0.875 0809	7.793 820	0.127 3266
2.012	0.874 0405	7.418 076	0.133 7210	2.062	0.875 5152	7.801 677	0.127 1991
2.013	0.874 4948	7.420 545	0.133 5871	2.063	0.875 9495	7.809 543	0.127 0722
2.014	0.874 9491	7.423 020	0.133 4538	2.064	0.876 3838	7.817 417	0.126 9452
2.015	0.875 4034	7.425 497	0.133 3201	2.065	0.876 8181	7.825 298	0.126 8183
2.016	0.875 8577	7.427 982	0.133 1871	2.066	0.877 2524	7.833 187	0.126 6915
2.017	0.876 3120	7.430 473	0.133 0540	2.067	0.877 6867	7.841 084	0.126 5649
2.018	0.876 7663	7.432 970	0.132 9210	2.068	0.878 1210	7.848 989	0.126 4384
2.019	0.877 2206	7.435 473	0.132 7882	2.069	0.878 5553	7.856 902	0.126 3120
2.020	0.877 6749	7.437 982	0.132 6555	2.070	0.878 9896	7.864 823	0.126 1858
2.021	0.878 1292	7.440 497	0.132 5229	2.071	0.879 4239	7.872 752	0.126 0597
2.022	0.878 5835	7.443 017	0.132 3904	2.072	0.879 8582	7.880 689	0.125 9337
2.023	0.879 0378	7.445 542	0.132 2581	2.073	0.880 2925	7.888 631	0.125 8078
2.024	0.879 4921	7.448 073	0.132 1259	2.074	0.880 7268	7.896 585	0.125 6820
2.025	0.879 9464	7.450 611	0.131 9938	2.075	0.881 1611	7.904 546	0.125 5564
2.026	0.880 4007	7.453 156	0.131 8619	2.076	0.881 5954	7.912 515	0.125 4309
2.027	0.880 8550	7.455 707	0.131 7301	2.077	0.882 0297	7.920 491	0.125 3056
2.028	0.881 3093	7.458 264	0.131 5985	2.078	0.882 4640	7.928 476	0.125 1803
2.029	0.881 7636	7.460 827	0.131 4669	2.079	0.882 8982	7.936 468	0.125 0552
2.030	0.882 2179	7.463 396	0.131 3355	2.080	0.883 3325	7.944 469	0.124 9302
2.031	0.882 6722	7.465 971	0.131 2043	2.081	0.883 7668	7.952 477	0.124 8053
2.032	0.883 1265	7.468 552	0.131 0731	2.082	0.884 2011	7.960 491	0.124 6806
2.033	0.883 5808	7.471 139	0.130 9421	2.083	0.884 6354	7.968 515	0.124 5560
2.034	0.884 0351	7.473 732	0.130 8112	2.084	0.885 0697	7.976 551	0.124 4315
2.035	0.884 4894	7.476 332	0.130 6805	2.085	0.885 5040	7.984 591	0.124 3071
2.036	0.884 9437	7.478 938	0.130 5500	2.086	0.885 9383	7.992 640	0.124 1829
2.037	0.885 3980	7.481 550	0.130 4194	2.087	0.886 3726	7.999 697	0.124 0588
2.038	0.885 8523	7.484 167	0.130 2890	2.088	0.886 8069	8.007 761	0.123 9348
2.039	0.886 3066	7.486 790	0.130 1588	2.089	0.887 2412	8.015 834	0.123 8109
2.040	0.886 7609	7.489 419	0.130 0287	2.090	0.887 6755	8.023 915	0.123 6871
2.041	0.887 2152	7.492 054	0.129 8987	2.091	0.888 1098	8.031 996	0.123 5635
2.042	0.887 6695	7.494 695	0.129 7689	2.092	0.888 5441	8.040 084	0.123 4400
2.043	0.888 1238	7.497 342	0.129 6392	2.093	0.888 9784	8.048 186	0.123 3166
2.044	0.888 5781	7.499 995	0.129 5096	2.094	0.889 4127	8.056 291	0.123 1934
2.045	0.889 0324	7.502 654	0.129 3801	2.095	0.889 8470	8.064 401	0.123 0702
2.046	0.889 4867	7.505 319	0.129 2507	2.096	0.890 2813	8.072 515	0.122 9472
2.047	0.889 9410	7.507 990	0.129 1217	2.097	0.890 7156	8.080 634	0.122 8243
2.048	0.890 3953	7.510 666	0.128 9928	2.098	0.891 1499	8.088 758	0.122 7016
2.049	0.890 8496	7.513 347	0.128 8637	2.099	0.891 5842	8.096 886	0.122 5789
2.050	0.891 3039	7.516 033	0.128 7349	2.100	0.892 0185	8.105 019	0.122 4564
$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}	$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}

The Exponential.

x	$\log_{10}(e^x)$	e^x	e^{-x}	x	$\log_{10}(e^x)$	e^x	e^{-x}
2.100	0.912 0184	8.166 170	0.122 4564	2.150	0.933 7131	8.584 858	0.116 4848
.101	.012 4527	.174 340	.122 3340	.151	.034 1674	.503 448	.116 3677
.102	.012 8870	.182 510	.122 2118	.152	.034 6617	.602 045	.116 2514
.103	.013 3213	.190 705	.122 0896	.153	.035 0360	.710 652	.116 1352
.104	.013 7556	.198 900	.121 9676	.154	.035 4703	.829 267	.116 0192
2.105	0.914 1899	8.207 163	0.121 8457	2.155	0.935 9946	8.627 890	0.115 9032
.106	.014 6242	.215 314	.121 7230	.156	.036 3380	.936 522	.115 7873
.107	.015 0585	.223 534	.121 6022	.157	.036 7732	.105 163	.115 6716
.108	.015 4928	.231 761	.121 4807	.158	.037 2075	.123 813	.115 5560
.109	.015 9271	.239 997	.121 3593	.159	.037 6418	.142 471	.115 4405
2.110	0.916 3614	8.248 241	0.121 2380	2.160	0.938 0761	8.671 138	0.115 3251
.111	.016 7957	.248 494	.121 1168	.161	.038 5104	.162 813	.115 2099
.112	.017 2599	.256 754	.120 9957	.162	.038 9447	.182 407	.115 0947
.113	.017 6642	.265 023	.120 8748	.163	.039 3790	.202 100	.114 9797
.114	.018 0985	.273 300	.120 7540	.164	.039 8133	.221 892	.114 8647
2.115	0.918 5328	8.289 586	0.120 6333	2.165	0.940 2476	8.714 602	0.114 7499
.116	.018 9671	.282 879	.120 5127	.166	.040 6818	.241 321	.114 6352
.117	.019 4014	.290 182	.120 3923	.167	.041 1161	.260 940	.114 5207
.118	.019 8357	.297 492	.120 2719	.168	.041 5504	.280 558	.114 4062
.119	.020 2700	.304 811	.120 1517	.169	.041 9847	.300 176	.114 2919
2.120	0.920 7013	8.331 137	0.120 0316	2.170	0.942 4190	8.758 284	0.114 1776
.121	.021 1380	.312 473	.119 9117	.171	.042 8533	.320 047	.114 0635
.122	.021 5729	.320 816	.119 7918	.172	.043 2876	.339 848	.113 9495
.123	.022 0078	.329 168	.119 6721	.173	.043 7219	.359 598	.113 8356
.124	.022 4417	.337 529	.119 5525	.174	.044 1562	.379 297	.113 7218
2.125	0.922 8758	8.372 807	0.120 4320	2.175	0.944 5903	8.802 185	0.113 6082
.126	.023 3101	.341 275	.119 3130	.176	.045 0246	.398 920	.113 4946
.127	.023 7444	.349 660	.119 1943	.177	.045 4589	.418 587	.113 3812
.128	.024 1787	.358 051	.119 0752	.178	.045 8932	.438 194	.113 2678
.129	.024 6130	.366 450	.118 9562	.179	.046 3277	.457 741	.113 1546
2.130	0.925 0472	8.414 867	0.118 8373	2.180	0.946 7600	8.846 306	0.113 0415
.131	.025 4815	.423 286	.118 7185	.181	.047 1943	.477 157	.112 9285
.132	.025 9158	.431 713	.118 5999	.182	.047 6286	.496 517	.112 8157
.133	.026 3501	.440 140	.118 4813	.183	.048 0629	.515 775	.112 7029
.134	.026 7844	.448 564	.118 3629	.184	.048 4971	.534 931	.112 5903
2.135	0.927 2187	8.457 047	0.118 2446	2.185	0.948 9334	8.890 649	0.112 4777
.136	.027 6530	.457 908	.118 1264	.186	.049 3677	.554 044	.112 3653
.137	.028 0873	.466 976	.118 0083	.187	.049 8020	.573 048	.112 2530
.138	.028 5216	.476 046	.117 8904	.188	.050 2363	.591 951	.112 1408
.139	.028 9559	.485 118	.117 7726	.189	.050 6706	.610 753	.112 0287
2.140	0.929 3902	8.499 438	0.117 6548	2.190	0.951 1049	8.935 213	0.111 9167
.141	.029 8245	.495 941	.117 5372	.191	.051 5392	.629 453	.111 8049
.142	.030 2588	.504 454	.117 4198	.192	.051 9735	.648 091	.111 6931
.143	.030 6931	.512 974	.117 3024	.193	.052 4078	.666 629	.111 5815
.144	.031 1274	.521 503	.117 1852	.194	.052 8421	.685 067	.111 4700
2.145	0.931 3617	8.542 041	0.117 0680	2.195	0.953 2764	8.980 001	0.111 3586
.146	.031 5960	.530 585	.116 9510	.196	.053 7107	.703 406	.111 2473
.147	.032 0303	.539 142	.116 8341	.197	.054 1450	.721 707	.111 1361
.148	.032 4645	.547 706	.116 7174	.198	.054 5793	.740 008	.111 0250
.149	.032 8988	.556 278	.116 6007	.199	.055 0136	.758 209	.110 9140
2.150	0.933 7331	8.584 858	0.116 4842	2.200	0.955 4479	9.025 013	0.110 8032
$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}	$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}

The Exponential.

u	$\log_{10}(e^u)$	e^u	e^{-u}	u	$\log_{10}(e^u)$	e^u	e^{-u}
2.200	0.035 4470	9.025 013	0.110 8032	2.250	0.077 1666	9.487 736	0.105 3992
2.201	.035 5822	.034 033	.110 6924	2.251	.077 2959	.497 228	.105 2930
2.202	.035 7164	.043 082	.110 5818	2.252	.077 4212	.506 730	.105 1886
2.203	.035 7507	.052 129	.110 4712	2.253	.077 4955	.516 242	.105 0835
2.204	.035 7850	.061 186	.110 3608	2.254	.077 5698	.525 763	.104 9785
2.205	0.035 7803	0.070 252	0.110 2505	2.255	0.077 5341	0.535 293	0.104 8735
2.206	.035 8530	.079 326	.110 1403	2.256	.077 7084	.544 833	.104 7687
2.207	.035 8879	.088 410	.110 0302	2.257	.078 2026	.554 383	.104 6640
2.208	.035 9222	.097 503	.109 9203	2.258	.078 6369	.563 942	.104 5594
2.209	.035 9565	.106 605	.109 8104	2.259	.078 7112	.573 511	.104 4549
2.210	0.036 7008	0.115 716	0.109 7006	2.260	0.078 5955	0.583 089	0.104 3505
2.211	.036 2251	.124 837	.109 5910	2.261	.078 6398	.592 677	.104 2463
2.212	.036 6594	.133 966	.109 4815	2.262	.078 3741	.602 275	.104 1420
2.213	.036 6937	.143 105	.109 3720	2.263	.078 8084	.611 882	.104 0379
2.214	.036 7280	.152 252	.109 2627	2.264	.078 2427	.621 498	.103 9339
2.215	0.036 9623	0.161 400	0.109 1535	2.265	0.078 6770	0.631 125	0.103 8300
2.216	.036 3066	.170 575	.109 0444	2.266	.078 6113	.640 761	.103 7263
2.217	.036 3409	.179 750	.108 9354	2.267	.078 5456	.650 406	.103 6226
2.218	.036 3752	.188 935	.108 8265	2.268	.078 4799	.660 061	.103 5190
2.219	.036 4095	.198 128	.108 7178	2.269	.078 4142	.669 726	.103 4155
2.220	0.036 4137	0.207 331	0.108 6091	2.270	0.078 3485	0.679 401	0.103 3122
2.221	.036 5080	.216 543	.108 5005	2.271	.078 2828	.689 085	.103 2089
2.222	.036 5023	.225 764	.108 3921	2.272	.078 2171	.698 779	.103 1058
2.223	.036 5366	.235 004	.108 2838	2.273	.078 1514	.708 483	.103 0027
2.224	.036 5709	.244 234	.108 1755	2.274	.078 0857	.718 196	.102 8998
2.225	0.036 3062	0.253 483	0.108 0674	2.275	0.078 0200	0.727 910	0.102 7969
2.226	.036 7395	.262 741	.107 9594	2.276	.078 4543	.737 632	.102 6943
2.227	.036 7738	.272 008	.107 8515	2.277	.078 3886	.747 364	.102 5915
2.228	.036 8081	.281 285	.107 7437	2.278	.078 3228	.757 107	.102 4890
2.229	.036 8424	.290 571	.107 6360	2.279	.078 2571	.766 900	.102 3865
2.230	0.036 8767	0.299 866	0.107 5281	2.280	0.078 1914	0.776 680	0.102 2842
2.231	.036 9110	.309 171	.107 4200	2.281	.078 1257	.786 462	.102 1820
2.232	.036 9453	.318 484	.107 3126	2.282	.078 0600	.796 253	.102 0798
2.233	.036 9796	.327 808	.107 2063	2.283	.077 9943	.806 054	.101 9778
2.234	.036 9739	.337 140	.107 0992	2.284	.077 9286	.815 865	.101 8759
2.235	0.036 6182	0.346 482	0.106 9921	2.285	0.077 8629	0.825 685	0.101 7741
2.236	.036 0525	.355 833	.106 8850	2.286	.077 7972	.835 517	.101 6723
2.237	.036 1068	.365 194	.106 7784	2.287	.077 7315	.845 357	.101 5707
2.238	.036 1511	.374 563	.106 6716	2.288	.077 6658	.855 208	.101 4694
2.239	.036 1853	.383 943	.106 5650	2.289	.077 6001	.865 068	.101 3678
2.240	0.036 8196	0.393 331	0.106 4585	2.290	0.077 5344	0.874 938	0.101 2665
2.241	.036 2539	.402 729	.106 3521	2.291	.077 4687	.884 818	.101 1652
2.242	.036 2882	.412 137	.106 2458	2.292	.077 4030	.894 707	.101 0641
2.243	.036 3225	.421 554	.106 1396	2.293	.077 3373	.904 607	.100 9631
2.244	.036 3568	.430 980	.106 0335	2.294	.077 2715	.914 517	.100 8622
2.245	0.036 9911	0.440 416	0.105 9275	2.295	0.077 2058	0.924 436	0.100 7614
2.246	.036 4254	.449 861	.105 8217	2.296	.077 1401	.934 365	.100 6607
2.247	.036 4597	.459 315	.105 7159	2.297	.077 0744	.944 305	.100 5601
2.248	.036 4940	.468 779	.105 6102	2.298	.077 0087	.954 254	.100 4596
2.249	.036 5283	.478 253	.105 5047	2.299	.076 9430	.964 213	.100 3592
2.250	0.036 5626	0.487 735	0.105 3992	2.300	0.076 8773	0.974 182	0.100 2588
$\log_{10}(e^u)$	$\log_{10}(e^u)$	e^u	e^{-u}	$\log_{10}(e^u)$	$\log_{10}(e^u)$	e^u	e^{-u}

The Exponential.

n	$\log_{10}(e^n)$	e^n	e^{-n}	n	$\log_{10}(e^n)$	e^n	e^{-n}
2.300	0.998 8773	9.074 182	0.100 2988	2.350	1.020 9920	10.485 570	0.005 3692
.301	.009 3135	.084 102	.100 1585	.351	.021 0561	.460 011	.005 2738
.302	.009 7450	.094 151	.100 0585	.352	.021 4606	.506 562	.005 1766
.303	1.000 1802	10.004 180	.099 0585	.353	.021 8940	.557 071	.005 0845
.304	.009 6145	.014 139	.099 8580	.354	.022 3292	.612 560	.004 9881
2.305	1.001 0488	10.024 178	0.099 7588	2.355	1.022 7653	10.538 129	0.004 8935
.306	.001 4831	.034 207	.099 6591	.356	.023 1978	.674 072	.004 7987
.307	.001 9174	.044 247	.099 5595	.357	.023 6321	.739 226	.004 7039
.308	.002 3517	.054 296	.099 4600	.358	.024 0664	.809 791	.004 6091
.309	.002 7860	.064 335	.099 3606	.359	.024 5007	.886 266	.004 5147
2.310	1.003 2203	10.074 425	0.099 2613	2.360	1.024 9390	10.590 051	0.004 4209
.311	.003 6545	.084 504	.099 1620	.361	.025 3763	.961 518	.004 3259
.312	.004 0888	.094 594	.099 0630	.362	.025 8036	1.038 155	.004 2316
.313	.004 5231	.104 693	.098 9639	.363	.026 2379	1.120 774	.004 1374
.314	.004 9574	.114 803	.098 8650	.364	.026 6722	1.209 400	.004 0433
2.315	1.005 3917	10.124 923	0.098 7662	2.365	1.027 1064	10.644 039	0.003 9493
.316	.005 8260	.124 953	.098 6675	.366	.027 5407	1.294 088	.003 8554
.317	.006 2603	.134 983	.098 5688	.367	.027 9750	1.389 348	.003 7616
.318	.006 6946	.135 343	.098 4703	.368	.028 4093	1.496 010	.003 6679
.319	.007 1289	.145 594	.098 3719	.369	.028 8436	1.604 700	.003 5743
2.320	1.007 5632	10.175 074	0.098 2736	2.370	1.029 2779	10.697 302	0.003 4807
.321	.007 5975	.155 853	.098 1754	.371	.029 7122	1.715 045	.003 3873
.322	.008 0318	.166 040	.098 0772	.372	.030 1465	1.832 898	.003 2940
.323	.008 4661	.176 247	.097 9792	.373	.030 5808	1.951 533	.003 2007
.324	.008 9004	.186 459	.097 8813	.374	.031 0151	2.071 488	.003 1076
2.325	1.009 3377	10.225 680	0.097 7834	2.375	1.031 4494	10.751 013	0.003 0145
.326	.010 7720	.196 642	.097 6857	.376	.031 8837	2.191 770	.002 9215
.327	.010 6063	.206 834	.097 5881	.377	.032 3180	2.323 557	.002 8289
.328	.011 0376	.217 050	.097 4905	.378	.032 7523	2.457 315	.002 7359
.329	.011 4718	.227 289	.097 3931	.379	.033 1866	2.593 103	.002 6432
2.330	1.011 9069	10.277 942	0.097 2957	2.380	1.033 6209	10.804 903	0.002 5505
.331	.012 3404	.238 225	.097 1985	.381	.034 0552	2.731 713	.002 4581
.332	.012 7747	.248 518	.097 1014	.382	.034 4895	2.869 551	.002 3657
.333	.013 2090	.258 822	.097 0043	.383	.034 9238	3.017 366	.002 2733
.334	.013 6433	.269 136	.096 9073	.384	.035 3580	3.165 209	.002 1811
2.335	1.014 3776	10.329 460	0.096 8105	2.385	1.035 7923	10.859 063	0.002 0890
.336	.014 8119	.279 705	.096 7137	.386	.036 2266	3.313 127	.002 0069
.337	.014 9462	.289 949	.096 6171	.387	.036 6609	3.461 803	.001 9150
.338	.015 3805	.299 403	.096 5205	.388	.037 0952	3.611 089	.001 8231
.339	.015 8148	.309 861	.096 4240	.389	.037 5295	3.761 286	.001 7314
2.340	1.016 8091	10.381 237	0.096 3276	2.390	1.037 9638	10.913 494	0.001 6397
.341	.016 2434	.319 623	.096 2314	.391	.038 3981	3.913 413	.001 5481
.342	.017 1777	.329 020	.096 1352	.392	.038 8324	4.064 343	.001 4566
.343	.017 5520	.338 427	.096 0391	.393	.039 2667	4.216 281	.001 3652
.344	.017 9863	.347 845	.095 9431	.394	.039 7010	4.369 239	.001 2739
2.345	1.018 4306	10.433 273	0.095 8472	2.395	1.040 1353	10.968 198	0.001 1827
.346	.018 8549	.357 211	.095 7514	.396	.040 5696	4.523 172	.001 0916
.347	.019 2891	.366 640	.095 6557	.397	.041 0039	4.679 150	.001 0005
.348	.019 7234	.376 020	.095 5601	.398	.041 4382	4.836 152	.000 9096
.349	.019 1577	.385 489	.095 4645	.399	.041 8725	4.994 159	.000 8187
2.350	1.020 9920	10.485 570	0.095 3692	2.400	1.042 3068	11.023 176	0.000 7280
$\log_{10}(e^n)$	$\log_{10}(e^n)$	e^n	e^{-n}	$\log_{10}(e^n)$	$\log_{10}(e^n)$	e^n	e^{-n}

The Exponential.

n	$\log_{10}(e^n)$	e^n	e^{-n}	n	$\log_{10}(e^n)$	e^n	e^{-n}
2.300	1.042 3688	11.023 176	0.090 7180	2.450	1.064 0215	11.588 347	0.086 2096
.301	.042 7411	.041 405	.000 6273	.451	.064 4558	.320 041	.086 2073
.302	.043 1751	.045 235	.000 5797	.452	.064 8901	.111 547	.086 1812
.303	.043 6090	.050 209	.000 5362	.453	.065 3244	.023 104	.086 0351
.304	.044 0429	.047 357	.000 5358	.454	.065 7587	.034 703	.085 9491
2.305	1.044 4782	11.078 430	0.090 2645	2.455	1.066 1930	11.646 434	0.085 8532
.306	.044 9125	.089 514	.000 1753	.456	.066 6272	.658 085	.085 7774
.307	.045 3468	.100 000	.000 0851	.457	.067 0615	.669 759	.085 6916
.308	.045 7811	.111 715	.000 0151	.458	.067 4958	.681 425	.085 6060
.309	.046 2154	.122 833	.000 0052	.459	.067 9301	.693 113	.085 5204
2.410	1.046 6107	11.133 961	0.089 8153	2.560	1.068 3634	11.704 812	0.085 4350
.411	.047 0450	.135 101	.000 7255	.561	.068 7977	.716 522	.085 3496
.412	.047 5183	.150 251	.000 6358	.562	.069 2320	.728 285	.085 2643
.413	.047 9926	.167 413	.000 5461	.563	.069 6663	.739 995	.085 1790
.414	.048 4669	.178 586	.000 4568	.564	.070 1016	.751 725	.085 0939
2.415	1.048 8412	11.189 779	0.089 3673	2.465	1.070 5389	11.763 482	0.085 0088
.416	.049 2555	.200 966	.000 2780	.466	.070 9732	.775 252	.084 9230
.417	.049 6898	.212 172	.000 1888	.467	.071 4075	.787 013	.084 8380
.418	.050 1241	.223 390	.000 0996	.468	.071 8418	.798 826	.084 7532
.419	.050 5584	.233 619	.000 0106	.469	.072 2761	.810 630	.084 6695
2.420	1.050 9826	11.245 820	0.088 9216	2.470	1.072 7074	11.822 227	0.084 5849
.421	.051 4269	.257 111	.000 8347	.471	.073 1417	.823 275	.084 5003
.422	.051 8612	.268 371	.000 7490	.472	.073 5760	.834 115	.084 4159
.423	.052 2955	.279 648	.000 6633	.473	.074 0103	.845 067	.084 3315
.424	.052 7298	.290 933	.000 5780	.474	.074 4446	.856 031	.084 2472
2.425	1.053 1641	11.302 229	0.088 4781	2.475	1.074 8788	11.881 707	0.084 1630
.426	.053 5984	.313 537	.000 4889	.476	.075 3131	.867 305	.084 0789
.427	.054 0327	.324 860	.000 4043	.477	.075 7474	.878 491	.084 0048
.428	.054 4670	.336 187	.000 3191	.478	.076 1817	.889 696	.084 0304
.429	.054 9013	.347 529	.000 2349	.479	.076 6160	.900 929	.084 0570
2.430	1.055 3396	11.358 882	0.088 0368	2.480	1.077 0503	11.941 261	0.084 7432
.431	.055 7739	.359 247	.000 1498	.481	.077 4846	.912 127	.084 6595
.432	.056 2082	.370 623	.000 0659	.482	.077 9189	.923 171	.084 5759
.433	.056 6425	.382 000	.000 7731	.483	.078 3532	.934 125	.084 4924
.434	.057 0768	.393 399	.000 6851	.484	.078 7875	.945 125	.084 4089
2.435	1.057 5071	11.415 819	0.087 5977	2.485	1.079 2218	12.001 120	0.084 3256
.436	.057 9414	.427 240	.000 5002	.486	.079 6561	.956 127	.084 2423
.437	.058 3757	.438 623	.000 4227	.487	.080 0904	.967 127	.084 1591
.438	.058 8090	.450 118	.000 3353	.488	.080 5247	.978 128	.084 0760
.439	.059 2432	.461 573	.000 2481	.489	.080 9590	.989 128	.084 0029
2.440	1.059 9785	11.473 017	0.087 1609	2.490	1.081 3933	12.061 296	0.084 0100
.441	.060 4128	.473 520	.000 1737	.491	.081 8276	.999 128	.084 0271
.442	.060 8471	.485 000	.000 0867	.492	.082 2619	.005 423	.084 7443
.443	.061 2814	.497 512	.000 8369	.493	.082 6962	.017 514	.084 6616
.444	.061 7157	.509 045	.000 8129	.494	.083 1304	.029 618	.084 5790
2.445	1.061 8900	11.530 530	0.086 7261	2.495	1.083 5647	12.121 734	0.084 4965
.446	.062 2833	.512 080	.000 6395	.496	.083 9990	.041 801	.084 4140
.447	.062 7186	.523 634	.000 5529	.497	.084 4333	.053 893	.084 3316
.448	.063 1529	.535 193	.000 4663	.498	.084 8676	.065 985	.084 2493
.449	.063 5872	.546 764	.000 3799	.499	.085 3019	.078 088	.084 1671
2.450	1.063 0215	11.588 317	0.086 2936	2.500	1.085 7362	12.182 494	0.084 0850
$\log_{10}(e^n)$	$\log_{10}(e^n)$	e^n	e^{-n}	$\log_{10}(e^n)$	$\log_{10}(e^n)$	e^n	e^{-n}

The Exponential.

x	$\log_{10}(e^x)$	e^x	e^{-x}	u	$\log_{10}(e^u)$	e^u	e^{-u}
2.500	1.085 7362	12.182 494	0.082 0850	2.550	1.107 4509	12.807 104	0.078 0817
-501	.086 1705	.104 083	.082 0030	.551	.107 8854	.819 917	.078 0036
-502	.086 6048	.200 883	.081 9210	.552	.108 3195	.832 744	.077 9257
-503	.087 0391	.419 095	.081 8391	.553	.108 7538	.845 583	.077 8478
-504	.087 4734	.831 322	.081 7573	.554	.109 1881	.858 435	.077 7700
2.505	1.087 0077	12.243 559	0.081 6756	2.555	1.109 6224	12.871 400	0.077 6922
-505	.088 3420	.255 809	.081 5940	.555	.110 0567	.884 177	.077 6146
-507	.088 7763	.408 071	.081 5124	.557	.110 4910	.897 068	.077 5370
-508	.089 2106	.816 345	.081 4309	.558	.110 9253	.909 972	.077 4595
-509	.089 6449	.163 631	.081 3495	.559	.111 3596	.922 888	.077 3821
2.510	1.090 0791	12.304 930	0.081 2682	2.560	1.111 7939	12.935 817	0.077 3047
-511	.090 5134	.317 241	.081 1870	.561	.112 2282	.935 769	.077 2275
-512	.090 9477	.634 595	.081 1059	.562	.112 6625	.948 715	.077 1503
-513	.091 3820	.126 900	.081 0248	.563	.113 0968	.961 681	.077 0732
-514	.091 8163	.253 248	.080 9438	.564	.113 5311	.974 664	.076 9961
2.515	1.092 2506	12.366 609	0.080 8620	2.565	1.113 9653	13.000 628	0.076 9192
-516	.092 6849	.506 982	.080 7821	.565	.114 3996	.987 656	.076 8423
-517	.093 1192	.101 367	.080 7013	.567	.114 8339	.100 681	.076 7655
-518	.093 5535	.203 764	.080 6207	.568	.115 2682	.103 710	.076 6888
-519	.093 9878	.407 534	.080 5401	.569	.115 7025	.106 755	.076 6121
2.520	1.094 4221	12.428 397	0.080 4595	2.570	1.116 1368	13.065 824	0.076 5355
-521	.094 8564	.811 032	.080 3792	.571	.116 5711	.109 827	.076 4590
-522	.095 2907	.163 479	.080 2988	.572	.117 0054	.112 882	.076 3826
-523	.095 7250	.326 958	.080 2185	.573	.117 4397	.115 941	.076 3063
-524	.096 1593	.653 411	.080 1381	.574	.117 8740	.119 004	.076 2300
2.525	1.095 9036	12.490 805	0.080 0581	2.575	1.118 3083	13.131 317	0.076 1538
-526	.096 3379	.130 302	.079 9783	.575	.118 7426	.122 055	.076 0777
-527	.096 7722	.260 602	.079 8984	.577	.119 1769	.125 100	.076 0017
-528	.097 2065	.521 484	.079 8185	.578	.119 6112	.128 149	.075 9257
-529	.097 6407	.104 999	.079 7387	.579	.120 0455	.131 202	.075 8498
2.530	1.098 3759	12.553 506	0.079 6590	2.580	1.120 4798	13.197 138	0.075 7740
-531	.098 8093	.260 666	.079 5794	.581	.120 9141	.134 259	.075 6983
-532	.099 2436	.521 638	.079 4999	.582	.121 3484	.137 319	.075 6226
-533	.099 6779	.104 223	.079 4204	.583	.121 7826	.140 384	.075 5470
-534	.100 1122	.208 821	.079 3410	.584	.122 2169	.143 453	.075 4715
2.535	1.100 6095	12.616 431	0.079 2617	2.585	1.122 6512	13.263 289	0.075 3961
-535	.101 0438	.419 054	.079 1825	.585	.123 0855	.146 527	.075 3207
-537	.101 4781	.838 089	.079 1034	.587	.123 5198	.149 604	.075 2454
-538	.101 9124	.167 137	.079 0243	.588	.123 9541	.152 684	.075 1702
-539	.102 3467	.334 268	.078 9453	.589	.124 3884	.155 767	.075 0951
2.540	1.103 0880	12.679 671	0.078 8664	2.590	1.124 8227	13.329 772	0.075 0200
-541	.103 5223	.692 357	.078 7876	.591	.125 2570	.158 853	.074 9451
-542	.103 9566	.138 950	.078 7088	.592	.125 6913	.161 937	.074 8701
-543	.104 3909	.277 907	.078 6300	.593	.126 1256	.165 024	.074 7953
-544	.104 8252	.555 821	.078 5516	.594	.126 5599	.168 114	.074 7206
2.545	1.105 5705	12.743 228	0.078 4731	2.595	1.126 2642	13.396 587	0.074 6459
-545	.105 9548	.115 078	.078 3946	.595	.127 0085	.171 207	.074 5713
-547	.106 3891	.230 740	.078 3163	.597	.127 4428	.174 302	.074 4967
-548	.106 8234	.461 515	.078 2380	.598	.127 8771	.177 401	.074 4223
-549	.107 2577	.923 033	.078 1598	.599	.128 3114	.180 504	.074 3479
2.550	1.107 4509	12.807 104	0.078 0817	2.600	1.129 1657	13.463 738	0.074 2736
$\log(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}	$\log(u)$	$\log_{10}(u)$	e^u	e^{-u}

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The Exponential.

u	$\log_e(u^2)$	e^u	e^{-u}	u	$\log_e(u^2)$	e^u	e^{-u}
2.600	1.129 1657	13.463 738	0.074 2737	2.650	1.180 8804	14.154 020	0.070 6512
.601	1.29 2999	.477 209	.074 1003	.651	1.51 3147	1.08 200	.070 5800
.602	1.30 0342	.490 642	.074 1354	.652	1.51 7490	1.182 373	.070 5101
.603	1.30 4685	.504 100	.074 0511	.653	1.52 1833	1.196 515	.070 4366
.604	1.30 9028	.517 701	.073 9771	.654	1.52 6176	1.210 708	.070 3609
2.605	1.131 3371	13.531 225	0.073 9031	2.685	1.153 0518	14.224 585	0.070 2988
.606	1.31 7714	.534 763	.073 8293	.686	1.53 4861	1.220 218	.070 2285
.607	1.32 2057	.538 315	.073 7555	.687	1.53 9204	1.233 465	.070 1584
.608	1.32 6400	.551 886	.073 6818	.688	1.54 3547	1.247 745	.070 0883
.609	1.33 0743	.558 450	.073 6081	.689	1.54 7890	1.261 000	.070 0182
2.610	1.133 5081	13.599 051	0.073 5345	2.690	1.155 2233	14.296 289	0.069 9482
.611	1.33 5429	.562 052	.073 4609	.691	1.55 6576	1.270 303	.069 8783
.612	1.34 1774	.566 270	.073 3876	.692	1.56 0919	1.284 940	.069 8085
.613	1.34 8115	.570 000	.073 3143	.693	1.56 5262	1.299 344	.069 7387
.614	1.35 2458	.583 559	.073 2410	.694	1.56 9605	1.313 589	.069 6690
2.615	1.135 6804	13.667 216	0.073 1678	2.695	1.157 3968	14.367 980	0.069 5994
.616	1.35 1841	.588 890	.073 0947	.696	1.57 3901	1.328 325	.069 5298
.617	1.35 5987	.594 528	.073 0216	.697	1.57 8254	1.343 771	.069 4603
.618	1.36 0130	.598 280	.072 9486	.698	1.58 2607	1.358 116	.069 3909
.619	1.36 4272	.602 095	.072 8757	.699	1.58 6960	1.372 550	.069 3215
2.620	1.137 8515	13.735 724	0.072 8029	2.690	1.159 5663	14.439 569	0.069 2522
.621	1.36 2858	.609 460	.072 7301	.691	1.59 0006	1.387 416	.069 1830
.622	1.36 7201	.613 223	.072 6574	.692	1.59 4349	1.401 878	.069 1139
.623	1.36 1544	.617 053	.072 5848	.693	1.59 8692	1.416 345	.069 0448
.624	1.36 5887	.620 777	.072 5122	.694	1.60 3034	1.430 811	.068 9758
2.625	1.139 0230	13.804 571	0.072 4398	2.695	1.161 7377	14.512 350	0.068 9068
.626	1.36 4572	.628 384	.072 3671	.696	1.60 7220	1.445 800	.068 8376
.627	1.36 8916	.632 211	.072 2950	.697	1.61 1563	1.460 292	.068 7685
.628	1.37 3259	.636 050	.072 2228	.698	1.61 5906	1.474 785	.068 6994
.629	1.37 7602	.639 903	.072 1506	.699	1.62 0249	1.489 278	.068 6303
2.630	1.142 1945	13.873 770	0.072 0785	2.680	1.163 9092	14.585 093	0.068 5612
.631	1.42 6288	.647 081	.072 0064	.681	1.62 4595	1.503 681	.068 4921
.632	1.43 0631	.650 545	.071 9344	.682	1.62 8938	1.518 168	.068 4230
.633	1.43 4974	.654 015	.071 8626	.683	1.63 3281	1.532 655	.068 3539
.634	1.43 9317	.657 489	.071 7907	.684	1.63 7624	1.547 142	.068 2848
2.635	1.144 3660	13.943 312	0.071 7190	2.685	1.166 0807	14.658 201	0.068 2152
.636	1.44 3603	.662 253	.071 6473	.686	1.64 1970	1.562 627	.068 1460
.637	1.44 7946	.666 227	.071 5757	.687	1.64 6313	1.577 547	.068 0769
.638	1.45 2289	.670 205	.071 5041	.688	1.65 0656	1.592 462	.068 0078
.639	1.45 6632	.674 197	.071 4327	.689	1.65 4999	1.607 375	.067 9389
2.640	1.146 5374	14.013 204	0.071 3613	2.690	1.168 2522	14.731 695	0.067 8699
.641	1.46 0917	.678 224	.071 2899	.691	1.66 9305	1.622 291	.067 8011
.642	1.46 5260	.682 158	.071 2187	.692	1.67 3648	1.637 199	.067 7323
.643	1.46 9603	.686 306	.071 1475	.693	1.67 7991	1.652 107	.067 6635
.644	1.47 3946	.690 369	.071 0764	.694	1.68 2334	1.667 015	.067 5947
2.645	1.148 7089	14.083 445	0.071 0054	2.695	1.170 4236	14.805 519	0.067 5254
.646	1.47 8232	.694 530	.070 9344	.696	1.68 6679	1.681 923	.067 4562
.647	1.48 2575	.698 614	.070 8635	.697	1.69 1022	1.696 831	.067 3870
.648	1.48 6918	.702 799	.070 7927	.698	1.69 5365	1.711 739	.067 3178
.649	1.49 1261	.706 882	.070 7219	.699	1.70 9708	1.726 647	.067 2486
2.650	1.150 8804	14.154 020	0.070 6512	2.700	1.172 5951	14.879 732	0.067 2055
$\log_e(e^2)$	$\log_e(e^2)$	e^2	e^{-2}	$\log_e(e^2)$	$\log_e(e^2)$	e^2	e^{-2}

The Exponential.

x	$\log_2(x^2)$	e^x	e^{-x}	x	$\log_2(x^2)$	e^x	e^{-x}
2.700	1.173 9951	14.879 732	0.067 2055	2.750	1.194 3098	15.642 632	0.063 9279
.701	.173 0394	.804 019	.067 1383	.751	.194 7441	.658 282	.063 8610
.702	.173 0637	.900 521	.067 0712	.752	.195 1784	.673 908	.063 8001
.703	.173 0880	.994 438	.067 0042	.753	.195 6127	.689 630	.063 7364
.704	.174 3323	.939 370	.066 9372	.754	.196 0470	.705 348	.063 6727
2.705	1.174 7666	14.054 317	0.066 8703	2.755	1.196 4813	15.721 011	0.063 6090
.706	.175 2009	.909 278	.066 8035	.756	.196 9156	.720 770	.063 5454
.707	.175 6352	.984 255	.066 7367	.757	.197 3499	.735 514	.063 4819
.708	.176 0695	.900 247	.066 6700	.758	.197 7842	.750 275	.063 4185
.709	.176 5038	15.014 251	.066 6039	.759	.198 2185	.764 951	.063 3551
2.710	1.176 9380	15.030 276	0.066 5368	2.760	1.198 6528	15.799 843	0.063 2918
.711	.177 3723	.944 312	.066 4703	.761	.199 0871	.781 651	.063 2285
.712	.177 8066	.959 354	.066 4039	.762	.199 5214	.831 474	.063 1653
.713	.178 2409	.974 437	.066 3375	.763	.199 9557	.847 314	.063 1022
.714	.178 6752	.989 513	.066 2712	.764	.200 3900	.863 169	.063 0391
2.715	1.179 1095	15.104 610	0.066 2050	2.765	1.200 8242	15.879 040	0.062 9761
.716	.179 5438	.119 722	.066 1381	.766	.201 2585	.884 927	.062 9132
.717	.179 9781	.134 850	.066 0727	.767	.201 6928	.900 830	.062 8503
.718	.180 4124	.149 992	.066 0066	.768	.202 1271	.926 749	.062 7875
.719	.180 8467	.165 190	.065 9407	.769	.202 5614	.942 683	.062 7247
2.720	1.181 2810	15.180 322	0.065 8748	2.770	1.202 9957	15.958 634	0.062 6620
.721	.181 7153	.195 590	.065 8089	.771	.203 4300	.974 601	.062 5994
.722	.182 1495	.210 713	.065 7431	.772	.203 8643	.990 583	.062 5368
.723	.182 5838	.225 932	.065 6774	.773	.204 2986	10.000 582	.062 4743
.724	.183 0181	.241 105	.065 6118	.774	.204 7329	.042 596	.062 4119
2.725	1.183 4525	15.256 414	0.065 5460	2.775	1.205 1672	16.038 637	0.062 3495
.726	.183 8868	.271 678	.065 4807	.776	.205 6015	.054 673	.062 2872
.727	.184 3211	.286 937	.065 4152	.777	.206 0358	.070 720	.062 2249
.728	.184 7553	.302 252	.065 3499	.778	.206 4701	.086 815	.062 1627
.729	.185 1896	.317 562	.065 2845	.779	.206 9044	.102 910	.062 1006
2.730	1.185 6239	15.332 887	0.065 2193	2.780	1.207 3387	16.119 721	0.062 0385
.731	.186 0582	.332 228	.065 1541	.781	.207 7730	.118 148	.061 9765
.732	.186 4925	.347 583	.065 0890	.782	.208 2072	.131 201	.061 9146
.733	.186 9268	.362 955	.065 0239	.783	.208 6415	.147 451	.061 8527
.734	.187 3611	.378 341	.064 9589	.784	.209 0758	.163 626	.061 7908
2.735	1.187 7954	15.409 743	0.064 8940	2.785	1.209 5101	16.199 818	0.061 7291
.736	.188 2297	.425 661	.064 8291	.786	.210 9444	.216 026	.061 6674
.737	.188 6640	.440 994	.064 7643	.787	.210 3787	.232 290	.061 6058
.738	.189 0983	.456 042	.064 6995	.788	.210 8130	.248 490	.061 5442
.739	.189 5326	.471 906	.064 6349	.789	.211 2473	.264 747	.061 4827
2.740	1.189 9669	15.486 985	0.064 5703	2.790	1.211 6816	16.281 020	0.061 4212
.741	.190 4012	.502 480	.064 5058	.791	.212 1159	.280 390	.061 3598
.742	.190 8355	.517 990	.064 4413	.792	.212 5502	.313 614	.061 2985
.743	.191 2698	.533 516	.064 3769	.793	.212 9845	.349 930	.061 2372
.744	.191 7041	.549 057	.064 3126	.794	.213 4188	.346 271	.061 1760
2.745	1.191 1384	15.564 614	0.064 2483	2.795	1.213 8531	16.362 629	0.061 1149
.746	.191 5726	.568 186	.064 1841	.796	.214 2874	.379 000	.061 0538
.747	.192 0069	.593 774	.064 1199	.797	.214 7217	.395 387	.061 0928
.748	.192 4412	.611 376	.064 0558	.798	.215 1560	.411 790	.061 0318
.749	.192 8755	.626 907	.063 9918	.799	.215 5903	.428 210	.061 0709
2.750	1.194 3098	15.642 632	0.063 9279	2.800	1.216 0245	16.444 647	0.060 8101
$\log_2(x^2)$	$\log_2(x^2)$	e^x	e^{-x}	$\log_2(x^2)$	$\log_2(x^2)$	e^x	e^{-x}

SMITHSONIAN TABLES

The Exponential.

n	$\log(n^2)$	e^n	e^{-n}	n	$\log(n^2)$	e^n	e^{-n}
2.800	1.216 6245	16.464 647	0.060 8101	2.850	1.237 7303	17.287 782	0.057 8143
2.801	1.216 6585	16.468 100	0.060 7993	2.851	1.237 7795	17.295 078	0.057 7895
2.802	1.216 6931	16.471 509	0.060 7889	2.852	1.237 8290	17.302 384	0.057 7647
2.803	1.217 3274	16.474 955	0.060 7790	2.853	1.237 8782	17.309 691	0.057 7399
2.804	1.217 7617	16.478 357	0.060 7693	2.854	1.237 9275	17.316 997	0.057 7151
2.805	1.218 0960	16.481 706	0.060 7608	2.855	1.237 9769	17.324 303	0.057 6903
2.806	1.218 6303	16.485 111	0.060 7513	2.856	1.238 0263	17.331 609	0.057 6655
2.807	1.219 0646	16.488 513	0.060 7429	2.857	1.238 0757	17.338 915	0.057 6407
2.808	1.219 4989	16.491 914	0.060 7345	2.858	1.238 1251	17.346 221	0.057 6159
2.809	1.219 9332	16.495 317	0.060 7262	2.859	1.238 1745	17.353 527	0.057 5911
2.810	1.220 3675	16.498 718	0.060 7179	2.860	1.238 2239	17.360 833	0.057 5663
2.811	1.220 8018	16.502 119	0.060 7095	2.861	1.238 2733	17.368 139	0.057 5415
2.812	1.221 2361	16.505 519	0.060 7012	2.862	1.238 3227	17.375 445	0.057 5167
2.813	1.221 6704	16.508 919	0.060 6928	2.863	1.238 3721	17.382 751	0.057 4919
2.814	1.222 1047	16.512 319	0.060 6845	2.864	1.238 4215	17.390 057	0.057 4671
2.815	1.222 5390	16.515 719	0.060 6761	2.865	1.238 4709	17.397 363	0.057 4423
2.816	1.222 9733	16.519 119	0.060 6678	2.866	1.238 5203	17.404 669	0.057 4175
2.817	1.223 4076	16.522 519	0.060 6594	2.867	1.238 5697	17.411 975	0.057 3927
2.818	1.223 8418	16.525 919	0.060 6511	2.868	1.238 6191	17.419 281	0.057 3679
2.819	1.224 2761	16.529 319	0.060 6427	2.869	1.238 6685	17.426 587	0.057 3431
2.820	1.224 7104	16.532 719	0.060 6344	2.870	1.238 7179	17.433 893	0.057 3183
2.821	1.225 1447	16.536 119	0.060 6260	2.871	1.238 7673	17.441 199	0.057 2935
2.822	1.225 5790	16.539 519	0.060 6177	2.872	1.238 8167	17.448 505	0.057 2687
2.823	1.226 0133	16.542 919	0.060 6093	2.873	1.238 8661	17.455 811	0.057 2439
2.824	1.226 4476	16.546 319	0.060 6010	2.874	1.238 9155	17.463 117	0.057 2191
2.825	1.226 8819	16.549 719	0.060 5926	2.875	1.238 9649	17.470 423	0.057 1943
2.826	1.227 3162	16.553 119	0.060 5843	2.876	1.239 0143	17.477 729	0.057 1695
2.827	1.227 7505	16.556 519	0.060 5759	2.877	1.239 0637	17.485 035	0.057 1447
2.828	1.228 1848	16.559 919	0.060 5676	2.878	1.239 1131	17.492 341	0.057 1199
2.829	1.228 6191	16.563 319	0.060 5592	2.879	1.239 1625	17.499 647	0.057 0951
2.830	1.229 0534	16.566 719	0.060 5509	2.880	1.239 2119	17.506 953	0.057 0703
2.831	1.229 4877	16.570 119	0.060 5425	2.881	1.239 2613	17.514 259	0.057 0455
2.832	1.229 9220	16.573 519	0.060 5342	2.882	1.239 3107	17.521 565	0.057 0207
2.833	1.230 3563	16.576 919	0.060 5258	2.883	1.239 3601	17.528 871	0.057 0000
2.834	1.230 7906	16.580 319	0.060 5175	2.884	1.239 4095	17.536 177	0.056 9752
2.835	1.231 2249	16.583 719	0.060 5091	2.885	1.239 4589	17.543 483	0.056 9504
2.836	1.231 6592	16.587 119	0.060 5008	2.886	1.239 5083	17.550 789	0.056 9256
2.837	1.232 0935	16.590 519	0.060 4924	2.887	1.239 5577	17.558 095	0.056 9008
2.838	1.232 5278	16.593 919	0.060 4841	2.888	1.239 6071	17.565 401	0.056 8760
2.839	1.232 9621	16.597 319	0.060 4757	2.889	1.239 6565	17.572 707	0.056 8512
2.840	1.233 3964	16.600 719	0.060 4674	2.890	1.239 7059	17.580 013	0.056 8264
2.841	1.233 8307	16.604 119	0.060 4590	2.891	1.239 7553	17.587 319	0.056 8016
2.842	1.234 2650	16.607 519	0.060 4507	2.892	1.239 8047	17.594 625	0.056 7768
2.843	1.234 6993	16.610 919	0.060 4423	2.893	1.239 8541	17.601 931	0.056 7520
2.844	1.235 1336	16.614 319	0.060 4340	2.894	1.239 9035	17.609 237	0.056 7272
2.845	1.235 5679	16.617 719	0.060 4256	2.895	1.239 9529	17.616 543	0.056 7024
2.846	1.236 0022	16.621 119	0.060 4173	2.896	1.239 1023	17.623 849	0.056 6776
2.847	1.236 4365	16.624 519	0.060 4089	2.897	1.239 1517	17.631 155	0.056 6528
2.848	1.236 8708	16.627 919	0.060 4006	2.898	1.239 2011	17.638 461	0.056 6280
2.849	1.237 3051	16.631 319	0.060 3922	2.899	1.239 2505	17.645 767	0.056 6032
2.850	1.237 7394	16.634 719	0.060 3839	2.900	1.239 3000	17.653 073	0.056 5784
$\log(e^2)$	$\log(e^3)$	e^2	e^{-2}	$\log(e^2)$	$\log(e^3)$	e^2	e^{-2}

The Exponential.

x	$\log_{10}(e^x)$	e^x	e^{-x}	x	$\log_{10}(e^x)$	e^x	e^{-x}
2.000	1.259 4510	18.174 145	0.055 0812	2.050	1.281 1687	19.105 954	0.052 3307
.001	.1259 8883	.192 329	.054 9682	.051	.281 6030	.125 959	.052 2874
.002	.250 3226	.290 530	.054 9133	.052	.282 0371	.144 201	.052 2351
.003	.375 7569	.388 730	.054 8584	.053	.282 4716	.163 358	.052 1829
.004	.501 1912	.486 988	.054 8036	.054	.282 9059	.182 511	.052 1308
2.005	1.261 6353	18.265 264	0.054 7488	2.055	1.283 3402	19.201 723	0.052 0787
.006	.626 0596	.585 318	.054 6941	.050	.283 7745	.200 934	.052 0266
.007	.751 4941	.683 811	.054 6394	.051	.284 2088	.220 165	.051 9745
.008	.876 9284	.782 322	.054 5848	.052	.284 6431	.239 414	.051 9223
.009	.999 3626	.881 451	.054 5302	.053	.285 0774	.258 683	.051 8702
2.010	1.263 7969	18.356 799	0.054 4757	2.060	1.285 5117	19.297 972	0.051 8180
.011	.1264 2312	.375 165	.054 4213	.001	.285 9460	.317 959	.051 7651
.012	.251 6655	.463 540	.054 3669	.002	.286 3803	.336 605	.051 7154
.013	.376 0998	.551 954	.054 3125	.003	.286 8145	.355 253	.051 6637
.014	.501 5341	.640 373	.054 2583	.004	.287 2488	.373 918	.051 6121
2.015	1.265 9684	18.448 812	0.054 2040	2.065	1.287 6831	19.394 703	0.051 5605
.016	.626 4027	.728 270	.054 1496	.005	.288 1174	.414 168	.051 5089
.017	.751 8370	.816 747	.054 0957	.006	.288 5517	.433 531	.051 4575
.018	.876 2713	.904 242	.054 0417	.007	.288 9860	.452 895	.051 4060
.019	.999 7056	.992 755	.053 9876	.008	.289 4203	.472 437	.051 3546
2.020	1.268 1399	18.541 287	0.053 9337	2.070	1.289 8546	19.491 920	0.051 3033
.021	.1268 5742	.880 838	.053 8798	.001	.290 2889	.511 421	.051 2520
.022	.251 0085	.969 407	.053 8259	.002	.290 7232	.530 912	.051 2008
.023	.376 4428	.106 995	.053 7721	.003	.291 1575	.550 403	.051 1496
.024	.501 8771	.165 601	.053 7184	.004	.291 5918	.570 043	.051 0985
2.025	1.270 3114	18.634 225	0.053 6647	2.075	1.292 2861	19.589 623	0.051 0474
.026	.626 7457	.152 870	.053 6111	.005	.292 7204	.600 323	.051 0964
.027	.751 1799	.241 534	.053 5575	.006	.293 1547	.620 842	.051 0454
.028	.876 6142	.330 213	.053 5039	.007	.293 5890	.641 480	.051 0945
.029	.999 0485	.418 912	.053 4503	.008	.294 0233	.662 130	.051 0437
2.030	1.272 4828	18.727 630	0.053 3970	2.080	1.294 1076	19.687 817	0.051 0928
.031	.1272 9171	.507 367	.053 3437	.001	.294 5419	.707 514	.051 0421
.032	.251 3514	.596 143	.053 2904	.002	.295 0061	.727 232	.051 0913
.033	.376 7857	.685 898	.053 2371	.003	.295 4704	.747 950	.051 0407
.034	.501 2200	.774 691	.053 1838	.004	.295 9347	.768 726	.051 0901
2.035	1.274 6543	18.821 502	0.053 1307	2.085	1.295 1690	19.786 502	0.051 0405
.036	.627 0886	.864 334	.053 0776	.005	.296 6033	.806 490	.051 0896
.037	.751 5229	.953 184	.053 0246	.006	.297 0675	.826 115	.051 0388
.038	.876 9572	.104 052	.052 9716	.007	.297 5318	.845 751	.051 0881
.039	.999 3915	.192 940	.052 9186	.008	.298 0061	.865 407	.051 0377
2.040	1.276 8258	18.915 846	0.053 0657	2.090	1.296 5405	19.885 682	0.051 0874
.041	.1277 2601	.954 772	.052 9129	.001	.297 0048	.905 578	.051 0372
.042	.251 6944	.103 716	.052 8591	.002	.297 4691	.925 494	.051 0869
.043	.376 1287	.192 659	.052 8054	.003	.297 9334	.945 429	.051 0368
.044	.501 5630	.281 601	.052 7517	.004	.298 3977	.965 385	.051 0867
2.045	1.278 9972	19.010 662	0.053 0621	2.095	1.297 1740	19.985 360	0.051 0366
.046	.627 4315	.103 683	.052 9495	.005	.298 1483	.985 355	.051 0866
.047	.751 8658	.192 622	.052 8970	.006	.298 6126	.100 371	.051 0367
.048	.876 2991	.281 560	.052 8445	.007	.299 0769	.120 306	.051 0867
.049	.999 7334	.370 497	.052 7921	.008	.299 5412	.140 251	.051 0368
2.050	1.281 1687	19.105 954	0.053 0307	3.000	1.302 8834	20.085 537	0.049 7871
$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}	$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}

The Exponential.

x	$\log_{10}(e^x)$	e^x	e^{-x}	x	$\log_{10}(e^x)$	e^x	e^{-x}
3.00	1.301 8813	20.085 537	0.049 7871	3.39	1.530 0307	33.115 452	0.030 1924
.01	.397 2531	.397 401	.679 2017	.51	.521 3276	.448 248	.039 8969
.02	.311 5931	.311 331	.618 8912	.52	.528 7166	.383 428	.040 5024
.03	.315 6123	.307 233	.618 3199	.53	.533 9365	34.123 968	.039 3040
.04	.320 2552	.305 243	.617 8349	.54	.537 9925	.466 919	.039 0133
3.05	1.324 3042	21.115 344	0.047 3589	3.55	1.541 7454	34.813 317	0.028 7246
.05	.328 9111	.327 557	.626 8877	.55	.546 0841	35.163 197	.028 4388
.06	.333 2811	.311 013	.626 4212	.57	.559 4313	.516 930	.028 1539
.07	.337 6270	.298 402	.625 9593	.58	.564 7742	.473 541	.027 8757
.08	.341 9569	.277 078	.625 5020	.59	.569 1172	36.234 076	.027 5933
3.10	1.346 3129	22.407 051	0.045 0492	3.60	1.563 4601	36.598 234	0.027 3217
.11	.350 6595	.261 051	.624 0010	.61	.567 8031	.660 033	.027 0518
.12	.354 9988	.246 386	.623 1572	.62	.572 1460	37.337 968	.026 7827
.13	.359 3317	.232 686	.622 3178	.63	.576 4890	.712 181	.026 5162
.14	.363 6617	23.103 897	.621 4828	.64	.580 8319	38.069 837	.026 2523
3.15	1.368 6276	23.336 065	0.042 8521	3.65	1.568 1749	38.474 666	0.026 9911
.15	.372 9606	.250 800	.620 4257	.66	.584 5178	.861 243	.026 7328
.16	.377 2815	.237 481	.619 0630	.67	.588 8607	39.251 968	.026 4765
.17	.381 5915	24.026 754	.618 5857	.68	.593 2037	.666 304	.026 2220
.18	.385 9004	.228 427	.618 1719	.69	.597 5466	40.031 817	.025 9693
3.20	1.369 7121	24.532 530	0.040 7622	3.70	1.605 8896	40.447 303	0.024 7235
.21	.390 0853	.279 686	.616 3896	.71	.611 2345	.853 807	.024 4775
.22	.394 3822	25.028 120	.615 9551	.72	.615 5755	41.263 304	.024 2340
.23	.398 6771	.279 657	.615 5575	.73	.619 9184	.670 108	.023 9908
.24	.402 9711	.253 722	.615 1939	.74	.624 2614	42.027 920	.023 7541
3.25	1.411 4571	25.790 130	0.038 7732	3.75	1.628 6013	42.521 082	0.023 5177
.25	.415 8000	26.029 517	.613 3681	.76	.632 9473	.618 426	.023 2837
.26	.420 1330	.311 339	.612 8661	.77	.637 2962	43.280 016	.023 0521
.27	.424 4659	.295 773	.612 4085	.78	.641 6381	.816 042	.022 8229
.28	.428 7988	.281 861	.611 9938	.79	.645 9791	44.297 490	.022 5956
3.30	1.413 1718	27.112 639	0.036 8832	3.80	1.650 3199	44.701 181	0.022 3708
.31	.437 5147	.385 125	.610 5012	.81	.654 6620	45.190 430	.022 1482
.32	.441 8577	.360 351	.610 1528	.82	.659 0049	.893 295	.021 9278
.33	.446 2006	.348 312	.609 7931	.83	.663 3479	46.062 538	.021 7096
.34	.450 5436	28.219 127	.609 4300	.84	.667 6908	.525 474	.021 4936
3.35	1.451 8866	28.902 731	0.035 0844	3.85	1.672 0338	46.503 063	0.021 2707
.35	.455 2295	.280 101	.608 7153	.86	.676 3767	47.495 351	.021 0480
.37	.463 5724	29.078 527	.608 2860	.87	.680 7196	.612 395	.020 8281
.38	.467 9153	.370 771	.607 8475	.88	.685 0625	48.422 215	.020 6098
.39	.472 2583	.365 954	.607 4087	.89	.689 4055	.610 887	.020 3933
3.40	1.476 6012	29.664 100	0.033 3713	3.90	1.693 7485	49.402 449	0.020 2439
.41	.480 9442	30.205 344	.603 0312	.91	.698 0914	.898 952	.020 0405
.42	.485 2871	.399 415	.602 7122	.92	.702 4344	50.400 415	.019 8411
.43	.489 6301	.386 643	.602 3860	.93	.706 7773	.606 978	.019 6437
.44	.493 9730	31.186 998	.602 0647	.94	.711 1203	51.418 601	.019 4482
3.45	1.498 3160	31.900 312	0.031 7456	3.95	1.715 4632	51.935 367	0.019 2547
.45	.497 6590	.386 077	.601 4268	.95	.719 8061	52.457 326	.019 0631
.47	.507 0019	32.135 742	.601 1179	.97	.724 1491	.684 531	.018 8734
.48	.511 3448	.459 722	.600 8074	.98	.728 4920	53.517 034	.018 6869
.49	.515 6877	.786 948	.600 5009	.99	.732 8350	54.034 880	.018 4967
3.50	1.520 0307	33.115 452	0.030 1924	4.00	1.737 1779	54.928 190	0.018 3195
$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}	$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}

The Exponential.

x	$\log(e^x)$	e^x	e^{-x}	x	$\log(e^x)$	e^x	e^{-x}
4.00	1.737 1779	54.598 130	0.018 3156	4.50	1.054 3352	90.017 131	0.011 1000
.01	.741 5209	55.146 871	.018 1334	.51	.058 6681	.921 819	.010 9285
.02	.745 8538	.761 105	.017 9539	.52	.063 0111	91.835 298	.010 8890
.03	.750 2068	56.360 911	.017 7743	.53	.067 3549	92.758 591	.010 7807
.04	.754 5897	.865 343	.017 5975	.54	.071 6969	93.690 800	.010 6734
4.05	1.758 8937	57.397 457	0.017 4224	4.55	1.076 0399	94.632 458	0.010 5672
.06	.763 2336	.974 311	.017 2490	.56	.080 3828	95.583 480	.010 4621
.07	.767 5785	58.550 963	.017 0774	.57	.084 7248	96.544 110	.010 3580
.08	.771 9215	59.145 470	.016 9073	.58	.089 0687	97.514 304	.010 2549
.09	.776 2644	.739 899	.016 7393	.59	.093 4117	98.494 430	.010 1520
4.10	1.780 6074	60.340 288	0.016 5727	4.60	1.097 7546	99.484 316	0.010 0518
.11	.784 9503	.946 718	.016 4078	.61	2.002 0976	100.484 150	.009 9518
.12	.789 2933	61.559 242	.016 2445	.62	.005 4405	101.494 012	.009 8538
.13	.793 6369	62.177 523	.016 0820	.63	.010 7835	102.514 064	.009 7568
.14	.797 9798	.662 821	.015 9220	.64	.015 1264	103.544 348	.009 6577
4.15	1.802 3221	63.434 000	0.015 7644	4.65	2.019 4693	104.584 985	0.009 5566
.16	.806 6650	64.071 523	.015 6076	.66	.023 8123	105.636 082	.009 4605
.17	.811 0080	.715 452	.015 4523	.67	.028 1552	106.697 742	.009 3723
.18	.815 3509	65.365 893	.015 2985	.68	.032 4982	107.770 073	.009 2730
.19	.819 6939	66.032 791	.015 1463	.69	.036 8411	108.853 180	.009 1817
4.20	1.824 0368	66.686 331	0.014 9936	4.70	2.041 1841	109.947 172	0.009 0853
.21	.828 3798	67.336 540	.014 8454	.71	.045 5270	111.052 860	.009 0048
.22	.832 7227	68.033 484	.014 6986	.72	.049 8700	112.168 253	.008 9152
.23	.837 0657	.717 232	.014 5524	.73	.054 2129	113.295 972	.008 8265
.24	.841 4086	69.407 952	.014 4076	.74	.058 5558	114.434 302	.008 7386
4.25	1.845 7515	70.105 412	0.014 2642	4.75	2.062 8683	115.584 385	0.008 6517
.26	.850 0945	.809 083	.014 1223	.76	.067 2417	116.745 996	.008 5656
.27	.854 4374	71.521 636	.013 9818	.77	.071 5847	117.919 242	.008 4804
.28	.858 7804	72.240 440	.013 8427	.78	.075 9276	119.104 350	.008 3960
.29	.863 1233	.966 408	.013 7049	.79	.080 2706	120.301 369	.008 3125
4.30	1.867 4663	73.699 794	0.013 5686	4.80	2.084 6135	121.510 418	0.008 2297
.31	.871 8093	74.440 480	.013 4335	.81	.088 5595	122.731 618	.008 1479
.32	.876 1522	75.188 628	.013 2999	.82	.093 3994	123.965 091	.008 0668
.33	.880 4951	.944 287	.013 1675	.83	.097 6423	125.210 961	.007 9865
.34	.884 8381	76.707 539	.013 0365	.84	.101 9853	126.469 352	.007 9071
4.35	1.889 1810	77.498 463	0.012 9068	4.85	2.106 3282	127.740 390	0.007 8281
.36	.893 5239	.76.257 134	.012 7784	.86	.110 6712	129.024 202	.007 7505
.37	.897 8669	79.043 632	.012 6512	.87	.115 0141	130.320 917	.007 6734
.38	.902 2098	.838 033	.012 5254	.88	.119 3571	131.630 664	.007 5970
.39	.906 5528	80.640 410	.012 4007	.89	.123 7000	132.953 574	.007 5214
4.40	1.910 8957	81.450 869	0.012 2773	4.90	2.128 0430	134.289 780	0.007 4466
.41	.915 2387	82.269 464	.012 1552	.91	.132 3859	135.639 414	.007 3725
.42	.919 5816	83.096 285	.012 0342	.92	.136 7289	137.002 613	.007 2991
.43	.923 9246	.931 417	.011 9145	.93	.141 0718	138.379 512	.007 2265
.44	.928 2675	84.774 042	.011 7959	.94	.145 4147	139.770 350	.007 1546
4.45	1.932 6104	85.626 044	0.011 6786	4.95	2.149 7577	141.174 966	0.007 0834
.46	.926 9534	86.487 599	.011 5624	.96	.154 0065	142.593 795	.007 0129
.47	.931 2963	87.359 721	.011 4473	.97	.158 4436	144.026 887	.006 9431
.48	.935 6393	88.234 673	.011 3334	.98	.162 8805	145.474 383	.006 8741
.49	.940 0822	89.121 440	.011 2206	.99	.167 3295	146.936 423	.006 8057
4.50	1.954 3352	90.017 131	0.011 1090	5.00	2.171 4724	148.413 159	0.006 7379
$\log(e^x)$	$\log(e^x)$	e^x	e^{-x}	$\log(e^x)$	$\log(e^x)$	e^x	e^{-x}

BRITISH TABLES

The Exponential.

x	$\log_{10}(e^x)$	e^x	e^{-x}	x	$\log_{10}(e^x)$	e^x	e^{-x}
5.00	2.171 4724	168.113 189	0.006 7379	5.30	2.388 6107	244.694 934	0.004 0868
.01	.175 8154	169.061 730	.006 6709	.31	.394 9640	247.151 127	.004 0461
.02	.351 6308	170.111 301	.006 6035	.32	.789 9280	249.635 037	.004 0058
.03	.527 4462	171.263 013	.006 5358	.33	1.184 8920	252.143 911	.003 9660
.04	.703 2616	172.517 045	.006 4677	.34	1.579 8560	254.677 909	.003 9265
5.05	2.193 1871	169.032 464	0.006 4993	5.35	2.410 3341	257.237 595	0.003 8875
.06	.197 5301	170.189 510	.006 4319	.36	.414 6773	259.822 836	.003 8488
.07	.394 8730	171.471 327	.006 3641	.37	.809 6413	262.434 621	.003 8105
.08	.591 2159	172.777 059	.006 2959	.38	1.204 6053	265.071 665	.003 7726
.09	.787 5588	174.107 814	.006 2276	.39	1.599 5693	267.735 608	.003 7350
5.10	2.213 0910	169.031 907	0.006 2597	5.40	2.432 0321	270.426 407	0.003 6979
.11	.217 4338	170.290 355	.006 1911	.41	.436 3050	273.144 238	.003 6611
.12	.414 7767	171.633 379	.006 1221	.42	.831 2690	275.889 383	.003 6246
.13	.611 2196	173.000 118	.006 0526	.43	1.226 2330	278.660 118	.003 5885
.14	.807 6625	174.390 708	.005 9827	.44	1.621 1970	281.466 718	.003 5529
5.15	2.236 6166	172.431 400	0.005 7934	5.45	2.453 7638	284.291 166	0.003 5175
.16	.240 9595	173.764 456	.005 7247	.46	.465 1058	287.148 613	.003 4825
.17	.437 3024	175.131 837	.005 6556	.47	.860 0707	290.034 534	.003 4479
.18	.633 7453	176.533 811	.005 5860	.48	1.255 0356	292.950 410	.003 4136
.19	.830 1882	177.970 553	.005 5160	.49	1.650 0005	295.897 611	.003 3796
5.20	2.258 3313	181.272 212	0.005 3166	5.50	2.475 0785	298.867 401	0.003 3460
.21	.252 6743	182.644 098	.005 2477	.51	.479 1615	301.861 061	.003 3127
.22	.449 0172	184.041 181	.005 1783	.52	.874 1264	304.889 931	.003 2797
.23	.645 4601	185.473 811	.005 1086	.53	1.269 0913	307.954 388	.003 2471
.24	.841 9030	186.941 103	.005 0386	.54	1.664 0562	311.054 411	.003 2148
5.25	2.280 0360	190.360 268	0.005 2175	5.55	2.497 1033	314.190 660	0.003 1828
.26	.285 3590	191.781 401	.005 1483	.56	.491 1842	317.363 349	.003 1511
.27	.481 7019	193.238 612	.005 0787	.57	.886 1491	320.573 733	.003 1198
.28	.678 1448	194.732 875	.005 0087	.58	1.281 1140	323.821 350	.003 0889
.29	.874 5877	196.264 445	.004 9384	.59	1.676 0789	327.107 621	.003 0585
5.30	2.301 7668	200.336 810	0.004 9965	5.60	2.518 9080	330.533 560	0.003 0276
.31	.309 1097	201.839 268	.004 9269	.61	.523 2509	334.099 181	.003 0074
.32	.505 4526	203.378 812	.004 8568	.62	.918 2158	337.705 654	.003 0070
.33	.701 8955	204.954 671	.004 7861	.63	1.313 1807	341.353 679	.003 0061
.34	.898 3384	206.567 210	.004 7150	.64	1.708 1456	345.043 741	.003 0058
5.35	2.323 4755	210.608 268	0.004 7682	5.65	2.540 6227	347.214 380	0.003 0070
.36	.313 8484	212.141 930	.004 7009	.66	.544 1957	350.866 141	.003 0061
.37	.509 2913	213.708 898	.004 6331	.67	.939 1606	354.568 910	.003 0058
.38	.705 7342	215.311 275	.004 5648	.68	1.334 1255	358.323 242	.003 0058
.39	.902 1771	216.949 386	.004 4960	.69	1.729 0904	362.129 681	.003 0058
5.40	2.345 1802	221.626 416	0.004 5166	5.70	2.562 3374	365.987 468	0.003 0061
.41	.318 5331	223.231 688	.004 4486	.71	.568 6803	369.797 155	.003 0061
.42	.514 9760	224.873 743	.004 3801	.72	.963 6452	373.658 414	.003 0058
.43	.711 4189	226.552 810	.004 3111	.73	1.358 6101	377.570 681	.003 0058
.44	.907 8618	228.269 413	.004 2421	.74	1.753 5750	381.534 510	.003 0058
5.45	2.366 9010	234.798 166	0.004 2963	5.75	2.584 1522	385.550 329	0.003 0061
.46	.322 8799	236.443 421	.004 2283	.76	.584 2271	389.618 124	.003 0058
.47	.518 3228	238.126 913	.004 1603	.77	.979 1920	393.738 491	.003 0058
.48	.713 7657	239.849 207	.004 0918	.78	1.374 1569	397.911 018	.003 0058
.49	.909 2086	241.611 207	.004 0233	.79	1.769 1218	402.136 410	.003 0058
5.50	2.388 6107	244.694 934	0.004 0868	5.80	2.605 7699	403.448 793	0.003 0058
$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}	$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}

The Exponential.

x	$\log_e(e^x)$	e^x	e^{-x}	x	$\log_e(e^x)$	e^x	e^{-x}
0.00	2.303 7660	403.438 703	0.001 4788	6.50	2.832 0141	665.141 633	0.001 5024
.01	2.310 1096	407.483 320	.001 4541	.51	2.837 2571	671.826 416	.001 4885
.02	2.315 4536	411.578 395	.001 4297	.52	2.841 6000	678.578 385	.001 4737
.03	2.321 7977	415.725 035	.001 4055	.53	2.845 9430	685.398 211	.001 4590
.04	2.328 1387	419.933 035	.001 3816	.54	2.850 2859	692.288 578	.001 4445
0.05	2.334 5766	424.213 030	0.001 3579	6.55	2.854 6289	699.244 174	0.001 4301
.06	2.341 0206	428.575 457	.001 3344	.56	2.858 9718	706.271 605	.001 4159
.07	2.347 4707	433.030 682	.001 3112	.57	2.863 3147	713.369 843	.001 4018
.08	2.354 0269	437.580 195	.001 2882	.58	2.867 6577	720.539 120	.001 3878
.09	2.360 5894	442.224 411	.001 2654	.59	2.872 0006	727.780 870	.001 3740
0.10	2.367 2583	446.857 770	0.001 2429	6.60	2.876 3436	735.095 189	0.001 3604
.11	2.373 9335	451.581 715	.001 2206	.61	2.880 6865	742.483 019	.001 3468
.12	2.380 6150	456.398 604	.001 1985	.62	2.885 0295	749.945 007	.001 3334
.13	2.387 3028	461.310 430	.001 1766	.63	2.889 3724	757.482 174	.001 3202
.14	2.394 0069	466.320 371	.001 1549	.64	2.893 7154	765.094 993	.001 3070
0.15	2.400 7273	471.431 387	0.001 1335	6.65	2.898 0583	772.784 326	0.001 2940
.16	2.407 4540	476.645 075	.001 1123	.66	2.902 4013	780.550 937	.001 2811
.17	2.414 1870	481.963 106	.001 0912	.67	2.906 7442	788.395 094	.001 2684
.18	2.421 0263	487.386 956	.001 0702	.68	2.911 0871	796.319 112	.001 2558
.19	2.427 8719	492.918 106	.001 0498	.69	2.915 4301	804.322 252	.001 2433
0.20	2.434 7338	498.559 041	0.001 0294	6.70	2.919 7730	812.405 825	0.001 2309
.21	2.441 6021	504.313 251	.001 0092	.71	2.924 1160	820.570 610	.001 2187
.22	2.448 4868	510.183 237	.001 0892	.72	2.928 4590	828.817 511	.001 2065
.23	2.455 3879	516.170 583	.001 0693	.73	2.932 8019	837.147 266	.001 1945
.24	2.462 3054	522.286 571	.001 0495	.74	2.937 1448	845.560 736	.001 1826
0.25	2.469 3395	528.532 825	0.001 0305	6.75	2.941 4878	854.058 763	0.001 1709
.26	2.476 3902	534.911 040	.001 0117	.76	2.945 8307	862.642 196	.001 1592
.27	2.483 4575	541.423 578	.001 0922	.77	2.950 1737	871.313 894	.001 1477
.28	2.490 5414	548.073 064	.001 0734	.78	2.954 5166	880.068 724	.001 1363
.29	2.497 6418	554.861 370	.001 0548	.79	2.958 8595	888.913 562	.001 1250
0.30	2.504 7588	561.790 080	0.001 0363	6.80	2.963 2025	897.847 992	0.001 1138
.31	2.511 8923	568.861 049	.001 0178	.81	2.967 5454	906.870 807	.001 1027
.32	2.519 0424	576.076 938	.001 0990	.82	2.971 8884	915.985 010	.001 0917
.33	2.526 2091	583.439 594	.001 0802	.83	2.976 2313	925.190 812	.001 0809
.34	2.533 3924	590.953 311	.001 0616	.84	2.980 5743	934.489 135	.001 0701
0.35	2.540 5924	598.620 700	0.001 0431	6.85	2.974 9172	943.880 967	0.001 0595
.36	2.547 8091	606.445 356	.001 0247	.86	2.979 2601	953.367 067	.001 0489
.37	2.555 0424	614.430 830	.001 0065	.87	2.983 6031	962.948 566	.001 0385
.38	2.562 2923	622.580 170	.001 0883	.88	2.987 9460	972.626 360	.001 0281
.39	2.569 5587	630.897 980	.001 0703	.89	2.992 2890	982.401 417	.001 0179
0.40	2.576 8417	639.388 036	0.001 0526	6.90	2.996 6320	992.274 716	0.001 0078
.41	2.584 1412	648.055 081	.001 0350	.91	3.000 9749	1002.34 724	.001 0078
.42	2.591 4573	656.891 714	.001 0176	.92	3.005 3178	1012.51 990	.001 0078
.43	2.598 7900	665.901 348	.001 0004	.93	3.009 6608	1022.80 398	.001 0078
.44	2.606 1393	675.088 890	.001 0834	.94	3.014 0037	1033.17 021	.001 0083
0.45	2.613 6052	684.458 703	0.001 0665	6.95	3.018 3466	1043.74 073	0.001 0086
.46	2.621 0877	694.016 057	.001 0500	.96	3.022 6895	1054.53 356	.001 0091
.47	2.628 5868	703.766 727	.001 0337	.97	3.027 0324	1065.54 275	.001 0097
.48	2.636 1025	713.716 946	.001 0176	.98	3.031 3753	1076.77 837	.001 0099
.49	2.643 6348	723.873 210	.001 0018	.99	3.035 7184	1088.24 148	.001 0099
0.50	2.651 1837	734.243 633	0.001 0000	7.00	3.040 0614	1099.95 316	0.001 0100
$\log_e(x)$	$\log_e(e^x)$	e^x	e^{-x}	$\log_e(e^x)$	$\log_e(e^x)$	e^x	e^{-x}

BRIDGMAN TABLES.

The Exponential.

n	$\log_e(e^n)$	e^n	e^{-n}	n	$\log_e(e^n)$	e^n	e^{-n}
7.00	3.045 0614	1096.033 310	0.000 9110	7.50	3.257 2086	1808.04 241	0.000 5531
.01	.004 4043	1107.695 450	.000 9028	.51	.161 5516	1826.21 354	.000 5476
.02	.008 7473	1118.38 012	.000 8958	.52	.325 8045	1844.56 790	.000 5421
.03	.013 0902	1129.03 061	.000 8890	.53	.470 2374	1863.10 590	.000 5367
.04	.017 4332	1141.38 761	.000 8821	.54	.574 5804	1881.83 603	.000 5314
7.05	3.061 7701	1152.85 874	0.000 8754	7.55	3.278 9213	1900.74 373	0.000 5261
.05	.021 766 1100	1164.44 517	.000 8688	.55	.728 2663	1919.86 551	.000 5209
.06	.026 1600	1176.14 803	.000 8622	.56	.837 6092	1939.16 028	.000 5157
.07	.030 5539	1187.96 152	.000 8558	.57	.931 9522	1958.62 897	.000 5105
.08	.034 9478	1199.90 780	.000 8494	.58	.991 2951	1978.31 321	.000 5053
.09	.039 3417	1211.96 707	0.000 8431	7.60	3.300 6181	1998.10 590	0.000 5005
7.10	3.083 4908	1224.14 755	.000 8369	.61	1.04 0810	2018.27 810	.000 4955
.11	.043 7348	1236.45 043	.000 8308	.62	1.100 7700	2038.66 213	.000 4905
.12	.048 1287	1248.87 507	.000 8247	.63	1.133 0669	2059.05 000	.000 4857
.13	.052 5226	1261.42 839	.000 8186	.64	1.188 0098	2079.74 382	.000 4808
.14	.056 9165	1274.10 596	0.000 8126	7.65	3.322 3528	2100.64 590	0.000 4760
7.15	3.105 2053	1286.91 003	.000 8067	.65	1.230 6037	2121.75 743	.000 4713
.15	.061 3104	1299.84 480	.000 8008	.66	1.334 0837	2143.08 165	.000 4666
.16	.065 7043	1312.90 820	.000 7949	.67	1.435 3861	2164.61 077	.000 4620
.17	.070 0982	1326.00 121	.000 7891	.68	1.539 7346	2186.37 450	.000 4574
7.20	3.126 0003	1339.23 076	0.000 7833	7.70	3.346 0675	2208.34 790	0.000 4528
.18	.074 4921	1352.36 777	.000 7775	.71	1.648 4805	2230.54 226	.000 4483
.19	.078 8860	1365.54 906	.000 7718	.72	1.754 7534	2252.95 550	.000 4438
.20	.083 2800	1378.82 250	.000 7661	.73	1.857 0963	2275.60 200	.000 4394
.21	.087 6739	1392.20 397	.000 7604	.74	1.961 4303	2298.47 258	.000 4350
7.25	3.148 0170	1405.70 483	0.000 7547	7.75	3.365 7822	2321.57 241	0.000 4307
.25	.092 0678	1419.23 054	.000 7490	.75	2.069 1242	2344.90 401	.000 4265
.26	.096 4617	1432.80 045	.000 7433	.76	2.174 4681	2368.47 139	.000 4222
.27	.100 8556	1446.41 803	.000 7376	.77	2.278 8111	2392.27 458	.000 4180
.28	.105 2495	1460.08 370	.000 7319	.78	2.383 1540	2416.31 758	.000 4139
.29	.109 6434	1473.80 093	0.000 7262	7.80	3.387 0970	2440.60 198	0.000 4097
7.30	3.170 3697	1487.57 719	.000 7205	.81	2.491 4309	2465.13 044	.000 4057
.31	.114 0376	1501.40 307	.000 7148	.82	2.595 7648	2489.90 541	.000 4016
.32	.118 4315	1515.28 177	.000 7091	.83	2.699 0987	2514.92 037	.000 3976
.33	.122 8254	1529.21 211	.000 7034	.84	2.803 4326	2540.20 483	.000 3937
7.35	3.192 0644	1556.19 653	0.000 6977	7.85	3.409 2117	2565.73 432	0.000 3898
.35	.126 6193	1570.18 050	.000 6920	.85	2.907 5456	2591.52 038	.000 3859
.36	.130 4132	1584.21 378	.000 6863	.86	3.011 8795	2617.56 539	.000 3820
.37	.134 2071	1598.30 077	.000 6806	.87	3.116 2134	2643.87 290	.000 3781
.38	.138 0010	1612.44 011	.000 6749	.88	3.220 5473	2670.44 302	.000 3742
.39	.141 7949	1626.63 115	0.000 6692	7.90	3.430 0764	2697.28 233	0.000 3703
7.40	3.213 7708	1640.98 443	.000 6635	.91	3.535 2604	2724.39 047	.000 3664
.41	.145 5888	1655.40 035	.000 6578	.92	3.640 4443	2751.77 105	.000 3625
.42	.149 3827	1669.86 722	.000 6521	.93	3.745 6282	2779.42 680	.000 3586
.43	.153 1766	1684.38 557	.000 6464	.94	3.850 8121	2807.36 051	.000 3548
.44	.156 9705	1698.95 581	0.000 6407	7.95	3.455 6111	2835.57 405	0.000 3509
7.45	3.235 4030	1713.58 115	.000 6350	.95	3.960 9951	2864.07 395	.000 3470
.45	.160 7644	1728.26 806	.000 6293	.96	4.066 1790	2892.85 736	.000 3432
.46	.164 5583	1743.00 609	.000 6236	.97	4.171 3629	2921.93 106	.000 3393
.47	.168 3522	1757.79 547	.000 6179	.98	4.276 5468	2951.30 606	.000 3354
.48	.172 1461	1772.63 659	0.000 6122	7.99	3.474 3559	2980.95 799	0.000 3315
.49	.175 9400	1787.52 950	.000 6065				
7.50	3.257 2086	1808.04 241	0.000 5531				
$\log_e(e^n)$	$\log_e(e^n)$	e^n	e^{-n}	$\log_e(e^n)$	$\log_e(e^n)$	e^n	e^{-n}

The Exponential.

x	$\log_{10}(e^x)$	e^x	e^{-x}	x	$\log_{10}(e^x)$	e^x	e^{-x}
8.00	3.474 3359	2980.05 799	0.000 3355	8.50	3.691 5031	4914.76 884	0.000 2015
.01	.478 0688	3010.21 711	.000 3321	.51	.695 8460	4964.16 300	.000 2014
.02	.483 0417	3041.17 733	.000 3288	.52	.700 1890	5014.05 370	.000 2004
.03	.487 3847	3071.74 167	.000 3255	.53	.704 5310	5064.44 583	.000 1975
.04	.491 7276	3102.61 319	.000 3223	.54	.708 8740	5115.34 430	.000 1935
8.05	3.495 0966	3133.79 497	0.000 3191	8.55	3.713 2178	5166.75 443	0.000 1935
.06	.496 4135	3165.29 013	.000 3159	.55	.717 5608	5218.68 117	.000 1910
.07	.497 7305	3197.10 183	.000 3128	.57	.721 9037	5271.12 970	.000 1897
.08	.499 0404	3229.23 324	.000 3097	.58	.726 2467	5324.10 553	.000 1878
.09	.513 4424	3261.68 757	.000 3066	.59	.730 5896	5377.61 368	.000 1860
8.10	3.517 7853	3294.46 808	0.000 3035	8.60	3.734 0325	5431.65 959	0.000 1841
.11	.522 1282	3327.57 803	.000 3005	.61	.738 2755	5486.36 868	.000 1823
.12	.526 4712	3361.00 075	.000 2975	.62	.743 0184	5541.38 630	.000 1805
.13	.530 8142	3394.79 957	.000 2946	.63	.747 0614	5597.07 875	.000 1787
.14	.535 1571	3428.91 787	.000 2916	.64	.752 3043	5653.32 082	.000 1769
8.15	3.539 5000	3463.37 907	0.000 2887	8.65	3.756 6473	5710.14 673	0.000 1751
.16	.543 8430	3498.18 050	.000 2859	.65	.760 9902	5767.33 466	.000 1734
.17	.548 1859	3533.34 396	.000 2830	.67	.765 3332	5825.19 935	.000 1717
.18	.552 5289	3568.85 486	.000 2802	.68	.769 6761	5884.04 639	.000 1700
.19	.556 8718	3604.72 225	.000 2774	.69	.774 0190	5943.18 224	.000 1683
8.20	3.561 8168	3640.95 031	0.000 2747	8.70	3.778 3620	6003.01 893	0.000 1666
.21	.565 5577	3677.54 247	.000 2719	.71	.782 7049	6063.24 846	.000 1649
.22	.569 9006	3714.50 236	.000 2690	.72	.787 0479	6124.17 000	.000 1631
.23	.574 2436	3751.83 375	.000 2665	.73	.791 3908	6185.78 811	.000 1617
.24	.578 5865	3789.54 031	.000 2639	.74	.795 7338	6247.89 571	.000 1601
8.25	3.585 9205	3827.62 582	0.000 2613	8.75	3.800 0767	6310.68 811	0.000 1585
.26	.587 7744	3866.09 410	.000 2587	.75	.804 4197	6374.21 158	.000 1570
.27	.591 6154	3904.84 892	.000 2561	.77	.808 7626	6438.17 246	.000 1553
.28	.595 9583	3944.10 438	.000 2535	.78	.813 1055	6502.87 717	.000 1538
.29	.600 3013	3983.83 419	.000 2510	.79	.817 4485	6568.23 218	.000 1522
8.30	3.609 6442	4023.87 239	0.000 2485	8.80	3.821 7914	6634.24 401	0.000 1507
.31	.608 0871	4064.31 298	.000 2460	.81	.826 1344	6700.91 987	.000 1492
.32	.612 3301	4105.16 001	.000 2436	.82	.830 4773	6768.60 403	.000 1477
.33	.617 6730	4146.41 755	.000 2413	.83	.834 8203	6837.09 682	.000 1463
.34	.622 0160	4188.08 974	.000 2388	.84	.839 1632	6906.40 304	.000 1448
8.35	3.626 3580	4230.18 074	0.000 2364	8.85	3.826 3056	6977.48 897	0.000 1434
.36	.630 7010	4272.59 477	.000 2340	.86	.847 8491	7049.48 274	.000 1420
.37	.635 0440	4315.61 606	.000 2317	.87	.852 1921	7123.28 097	.000 1405
.38	.639 3870	4359.00 833	.000 2294	.88	.856 5350	7198.79 074	.000 1392
.39	.643 7307	4403.81 769	.000 2271	.89	.860 8779	7275.01 618	.000 1378
8.40	3.648 0736	4447.06 675	0.000 2249	8.90	3.865 7200	7353.07 354	0.000 1364
.41	.652 4166	4491.76 051	.000 2226	.91	.869 5038	7432.66 110	.000 1350
.42	.656 7595	4537.00 346	.000 2204	.92	.873 9068	7513.08 923	.000 1337
.43	.661 1025	4582.30 000	.000 2182	.93	.878 2497	7595.96 538	.000 1324
.44	.665 4454	4628.35 498	.000 2161	.94	.882 5927	7681.19 706	.000 1310
8.45	3.669 7884	4673.07 274	0.000 2139	8.95	3.880 0356	7767.80 186	0.000 1307
.46	.674 1313	4722.05 800	.000 2118	.95	.891 2786	7856.35 740	.000 1294
.47	.678 4743	4769.41 547	.000 2097	.97	.895 6215	7946.60 161	.000 1272
.48	.682 8172	4817.44 590	.000 2076	.98	.899 9644	8038.63 212	.000 1259
.49	.687 1602	4865.86 607	.000 2055	.99	.904 3074	8132.45 690	.000 1247
8.50	3.691 5031	4914.76 884	0.000 2035	9.00	3.908 6503	8203.08 393	0.000 1234
$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}	$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}

SMITHSONIAN TABLES.

The Exponential.

n	$\log_e(e^n)$	e^n	e^{-n}	n	$\log_e(e^n)$	e^n	e^{-n}
0.00	3.000 0000	8103.08 303	0.000 1234	0.50	4.125 7036	13359.7 268	0.000 0710
0.01	3.012 0033	8116.52 127	0.000 1222	0.51	4.130 1405	13403.9 943	0.000 0701
0.02	3.024 0162	8130.07 708	0.000 1210	0.52	4.134 5835	13449.0 132	0.000 0693
0.03	3.036 0287	8143.75 057	0.000 1198	0.53	4.138 9164	13494.5 011	0.000 0685
0.04	3.048 0408	8157.55 706	0.000 1186	0.54	4.143 2504	13540.4 470	0.000 0677
0.05	3.060 0525	8171.58 702	0.000 1174	0.55	4.147 5847	13586.6 947	0.000 0670
0.06	3.072 0638	8185.84 065	0.000 1162	0.56	4.151 9192	13633.2 461	0.000 0662
0.07	3.084 0748	8199.32 381	0.000 1151	0.57	4.156 2538	13680.2 101	0.000 0654
0.08	3.096 0854	8213.03 603	0.000 1139	0.58	4.160 5881	13727.4 193	0.000 0647
0.09	3.108 0957	8226.98 605	0.000 1128	0.59	4.164 9221	13774.8 695	0.000 0639
0.10	3.120 1057	8241.18 270	0.000 1117	0.60	4.169 2570	13822.6 786	0.000 0632
0.11	3.132 1153	8255.62 480	0.000 1106	0.61	4.173 5920	13870.8 701	0.000 0625
0.12	3.144 1247	8270.31 160	0.000 1095	0.62	4.177 9270	13919.4 490	0.000 0617
0.13	3.156 1338	8285.25 197	0.000 1084	0.63	4.182 2620	13968.4 361	0.000 0610
0.14	3.168 1428	8300.45 513	0.000 1073	0.64	4.186 5968	14017.7 437	0.000 0603
0.15	3.180 1515	8315.92 028	0.000 1062	0.65	4.190 9318	14067.4 881	0.000 0596
0.16	3.192 1599	8331.65 708	0.000 1051	0.66	4.195 2667	14117.5 847	0.000 0589
0.17	3.204 1681	8347.66 469	0.000 1041	0.67	4.199 6017	14168.0 490	0.000 0582
0.18	3.216 1761	8363.95 272	0.000 1031	0.68	4.203 9366	14218.9 460	0.000 0575
0.19	3.228 1839	8380.52 028	0.000 1021	0.69	4.208 2715	14270.2 443	0.000 0568
0.20	3.240 1915	8397.37 926	0.000 1010	0.70	4.212 6065	14321.9 072	0.000 0561
0.21	3.252 1989	8414.52 080	0.000 1000	0.71	4.216 9414	14374.0 219	0.000 0554
0.22	3.264 2061	8431.96 643	0.000 0990	0.72	4.221 2764	14426.5 447	0.000 0547
0.23	3.276 2132	8449.71 415	0.000 0981	0.73	4.225 6113	14479.4 581	0.000 0540
0.24	3.288 2201	8467.76 386	0.000 0971	0.74	4.230 0003	14532.7 414	0.000 0533
0.25	3.299 2269	8486.12 057	0.000 0961	0.75	4.234 3892	14586.4 388	0.000 0526
0.26	3.311 2335	8504.78 333	0.000 0952	0.76	4.238 7781	14640.5 971	0.000 0519
0.27	3.323 2399	8523.75 509	0.000 0942	0.77	4.243 1670	14695.1 072	0.000 0512
0.28	3.335 2462	8543.03 310	0.000 0933	0.78	4.247 5559	14750.1 010	0.000 0505
0.29	3.347 2523	8562.61 841	0.000 0923	0.79	4.251 9448	14805.5 002	0.000 0498
0.30	3.359 2583	8582.51 102	0.000 0914	0.80	4.256 3337	14861.4 499	0.000 0491
0.31	3.371 2642	8602.71 481	0.000 0905	0.81	4.260 7226	14917.8 871	0.000 0484
0.32	3.383 2699	8623.23 819	0.000 0896	0.82	4.265 1115	14974.7 309	0.000 0477
0.33	3.395 2755	8644.08 315	0.000 0887	0.83	4.269 5004	15032.0 542	0.000 0470
0.34	3.407 2810	8665.25 082	0.000 0878	0.84	4.273 8892	15089.7 100	0.000 0463
0.35	3.419 2864	8686.75 234	0.000 0869	0.85	4.278 2781	15147.8 894	0.000 0456
0.36	3.431 2917	8708.59 185	0.000 0861	0.86	4.282 6670	15206.5 300	0.000 0449
0.37	3.443 2969	8730.76 151	0.000 0852	0.87	4.287 0559	15265.7 327	0.000 0442
0.38	3.455 3020	8753.26 148	0.000 0844	0.88	4.291 4448	15325.5 500	0.000 0435
0.39	3.467 3070	8776.09 953	0.000 0836	0.89	4.295 8337	15385.9 500	0.000 0428
0.40	3.479 3119	8800.27 807	0.000 0827	0.90	4.300 2226	15447.0 701	0.000 0421
0.41	3.491 3167	8824.71 710	0.000 0819	0.91	4.304 6115	15508.7 340	0.000 0414
0.42	3.503 3214	8849.42 822	0.000 0811	0.92	4.309 0004	15571.0 926	0.000 0407
0.43	3.515 3260	8874.42 267	0.000 0803	0.93	4.313 3892	15634.0 406	0.000 0400
0.44	3.527 3305	8899.70 160	0.000 0795	0.94	4.317 7781	15697.6 443	0.000 0393
0.45	3.539 3349	8925.27 633	0.000 0787	0.95	4.322 1670	15762.0 330	0.000 0386
0.46	3.551 3392	8951.15 844	0.000 0779	0.96	4.326 5559	15827.1 957	0.000 0379
0.47	3.563 3435	8977.35 872	0.000 0771	0.97	4.330 9448	15893.0 861	0.000 0372
0.48	3.575 3477	9003.87 865	0.000 0763	0.98	4.335 3337	15959.7 125	0.000 0365
0.49	3.587 3519	9030.72 953	0.000 0755	0.99	4.339 7226	16027.2 088	0.000 0358
0.50	3.599 3560	9057.92 268	0.000 0747	1.00	4.344 1115	16095.6 658	0.000 0351
$\log_e(e^n)$	$\log_e(e^n)$	e^n	e^{-n}	$\log_e(e^n)$	$\log_e(e^n)$	e^n	e^{-n}

SMITHSONIAN TABLES.

The Exponential.

x	$\log_{10}(e^x)$	e^x	e^{-x}	x	$\log_{10}(e^x)$	e^x	e^{-x}
10.00	4.343 0648	22026.4 658	0.000 0454	10.50	4.560 0021	36115.5 027	0.000 0375
.01	.347 1878	22241.3 355	.000 0449	.51	.584 4350	36680.4 795	.000 0274
.02	.694 3757	22471.4 399	.000 0445	.52	.588 7770	37240.1 245	.000 0270
.03	1.041 5637	22707.2 715	.000 0441	.53	.593 1200	37811.4 764	.000 0267
.04	1.388 7516	22953.3 820	.000 0436	.54	.597 4638	38393.5 665	.000 0265
10.05	4.635 6595	23203.7 868	0.000 0432	10.55	4.581 8068	38977.4 383	0.000 0262
.06	.709 0095	23388.5 054	.000 0428	.56	.602 1697	39563.1 179	.000 0259
.07	1.056 1974	23583.5 648	.000 0423	.57	.606 4927	40150.6 737	.000 0257
.08	1.403 3853	23780.0 855	.000 0419	.58	.610 8156	40740.1 144	.000 0254
.09	1.750 5732	24000.7 924	.000 0415	.59	.615 1385	41335.4 891	.000 0252
10.10	4.786 3743	24263.0 094	0.000 0411	10.60	4.603 5215	40934.8 571	0.000 0250
.11	1.090 7172	24507.6 007	.000 0407	.61	.607 8645	41538.1 993	.000 0247
.12	1.395 0601	24764.7 708	.000 0403	.62	.612 2074	42144.5 360	.000 0244
.13	1.699 4030	25034.3 044	.000 0399	.63	.616 5503	42753.7 712	.000 0242
.14	2.003 7459	25316.4 605	.000 0395	.64	.620 8932	43365.9 050	.000 0239
10.15	4.408 0890	25591.1 092	0.000 0391	10.65	4.645 5215	42702.5 945	0.000 0237
.16	1.112 4319	25888.2 071	.000 0387	.66	.625 2362	43378.0 380	.000 0234
.17	1.416 7748	26198.0 788	.000 0383	.67	.629 5809	44056.4 415	.000 0232
.18	1.721 1177	26510.4 673	.000 0379	.68	.633 9256	44737.5 594	.000 0229
.19	2.025 4606	26835.4 940	.000 0375	.69	.638 2703	45421.4 070	.000 0228
10.20	4.439 8917	26963.1 801	0.000 0372	10.70	4.660 9510	44355.8 551	0.000 0225
.21	1.124 3467	27173.5 695	.000 0368	.71	.642 6139	44953.1 372	.000 0223
.22	1.428 6896	27400.0 665	.000 0364	.72	.646 9586	45553.0 028	.000 0221
.23	1.733 0325	27734.5 101	.000 0361	.73	.651 3033	46155.0 630	.000 0219
.24	2.037 3754	28081.1 290	.000 0357	.74	.655 6480	46759.0 519	.000 0217
10.25	4.451 5184	28288.5 419	0.000 0354	10.75	4.683 6657	44630.0 285	0.000 0214
.26	1.136 8614	28566.7 862	.000 0350	.76	.659 9906	47298.0 680	.000 0212
.27	1.441 2043	28853.5 892	.000 0347	.77	.664 3353	47908.0 175	.000 0210
.28	1.745 5472	29143.8 736	.000 0343	.78	.668 6800	48520.0 342	.000 0208
.29	2.049 8901	29436.7 744	.000 0340	.79	.673 0247	49133.0 360	.000 0206
10.30	4.473 2332	29732.0 180	0.000 0336	10.80	4.700 3804	49020.8 081	0.000 0204
.31	1.149 2761	29931.4 266	.000 0333	.81	.677 3733	49533.1 684	.000 0202
.32	1.453 6190	30133.2 576	.000 0330	.82	.681 7180	50046.0 870	.000 0200
.33	1.757 9619	30338.1 210	.000 0326	.83	.686 0627	50559.1 708	.000 0198
.34	2.062 3048	30546.0 300	.000 0323	.84	.690 4074	51072.3 780	.000 0196
10.35	4.494 9479	31257.0 428	0.000 0320	10.85	4.712 0951	51534.1 514	0.000 0194
.36	1.161 2190	31471.1 813	.000 0317	.86	.694 7518	52046.0 782	.000 0192
.37	1.465 5619	31688.4 770	.000 0314	.87	.699 1065	52558.0 103	.000 0190
.38	1.769 9048	31908.0 615	.000 0310	.88	.703 4612	53070.0 599	.000 0188
.39	2.074 2477	32130.6 660	.000 0307	.89	.707 8159	53582.0 000	.000 0186
10.40	4.516 6626	32359.6 257	0.000 0304	10.90	4.733 8090	54176.3 618	0.000 0185
.41	1.173 0026	32580.8 704	.000 0301	.91	.712 1528	54720.8 453	.000 0183
.42	1.477 3455	32803.4 241	.000 0298	.92	.716 5075	55265.3 989	.000 0181
.43	1.781 6884	33028.0 303	.000 0295	.93	.720 8622	55810.0 707	.000 0179
.44	2.086 0313	33254.0 524	.000 0292	.94	.725 2169	56354.7 431	.000 0177
10.45	4.538 3773	34544.3 747	0.000 0289	10.95	4.755 5346	56944.0 454	0.000 0176
.46	1.185 2035	34767.5 524	.000 0287	.96	.729 5793	57500.4 030	.000 0174
.47	1.490 5464	35000.0 174	.000 0284	.97	.734 0340	58056.8 054	.000 0172
.48	1.795 8893	35234.0 075	.000 0281	.98	.738 4887	58613.2 543	.000 0170
.49	2.100 2322	35469.4 574	.000 0278	.99	.742 9434	59170.7 441	.000 0169
10.50	4.560 0221	36115.5 027	0.000 0275	11.00	4.777 2393	59874.1 417	0.000 0167
$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}	$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}

BRITISH TABLES.

The Exponential.

x	$\log_{10}(e^x)$	e^x	e^{-x}	x	$\log_{10}(e^x)$	e^x	e^{-x}
11.00	4.777 2303	50874.1 417	0.000 0167	11.50	4.994 3855	98715.7 716	0.000 0101
.01	.781 5822	60475.8 868	.000 0165	.51	.998 2395	99707.8 816	.000 0100
.02	.785 0251	61081.6 796	.000 0164	.52	5.003 0734	100 709.036	.000 0099
.03	.789 2681	61697.5 808	.000 0162	.53	.007 4156	101 722.114	.000 0098
.04	.794 0111	62317.6 518	.000 0160	.54	.011 7583	102 746.438	.000 0097
11.05	4.798 0540	62943.0 546	0.000 0159	11.55	5.016 1013	103 777.037	0.000 0096
.06	.803 2070	63579.5 510	.000 0157	.56	.020 4442	104 810.013	.000 0095
.07	.807 6304	64218.5 068	.000 0156	.57	.024 7872	105 873.472	.000 0094
.08	.811 9830	64860.8 834	.000 0154	.58	.029 1301	106 937.518	.000 0093
.09	.816 3258	65513.7 491	.000 0153	.59	.033 4730	108 012.258	.000 0092
11.10	4.820 6687	66171.1 002	0.000 0151	11.60	5.037 8160	109 097.790	0.000 0092
.11	.825 0117	66846.1 014	.000 0150	.61	.042 1589	110 196.250	.000 0091
.12	.829 3546	67527.0 063	.000 0148	.62	.046 5010	111 301.731	.000 0090
.13	.833 6976	68216.3 720	.000 0147	.63	.050 8446	112 420.312	.000 0089
.14	.838 0405	68913.6 504	.000 0145	.64	.055 1898	113 550.105	.000 0088
11.15	4.844 3185	69619.8 281	0.000 0144	11.65	5.059 5307	114 691.363	0.000 0087
.16	.848 7306	70335.0 503	.000 0142	.66	.063 8737	115 845.090	.000 0086
.17	.853 0634	71059.1 106	.000 0141	.67	.068 2166	117 008.282	.000 0085
.18	.857 3963	71792.3 621	.000 0140	.68	.072 5595	118 186.235	.000 0085
.19	.861 7293	72534.7 818	.000 0138	.69	.076 9025	119 372.250	.000 0084
11.20	4.861 0982	73290.4 418	0.000 0137	11.70	5.081 2151	120 571.715	0.000 0083
.21	.865 4411	73985.4 190	.000 0135	.71	.085 5584	121 784.481	.000 0082
.22	.869 7841	74697.7 748	.000 0134	.72	.089 9013	123 007.435	.000 0081
.23	.874 1270	75427.5 051	.000 0133	.73	.094 2443	124 243.370	.000 0080
.24	.878 4700	76174.9 518	.000 0131	.74	.098 5872	125 492.240	.000 0080
11.25	4.885 8139	76870.9 198	0.000 0130	11.75	5.102 9602	126 753.350	0.000 0079
.26	.880 1569	77581.5 758	.000 0129	.76	.102 9031	128 027.453	.000 0078
.27	.884 4998	78304.0 072	.000 0127	.77	.111 6461	129 314.151	.000 0077
.28	.888 8428	79038.2 619	.000 0126	.78	.115 9890	130 613.786	.000 0077
.29	.893 1857	79784.4 488	.000 0125	.79	.120 3319	131 926.470	.000 0076
11.30	4.897 5266	80542.6 375	0.000 0124	11.80	5.124 6740	133 252.353	0.000 0075
.31	.891 8696	81313.0 085	.000 0122	.81	.129 0178	134 591.501	.000 0074
.32	.896 2125	82094.3 430	.000 0121	.82	.133 3608	135 944.229	.000 0073
.33	.890 5555	82883.0 248	.000 0120	.83	.137 7037	137 310.401	.000 0072
.34	.894 8984	83681.0 311	.000 0119	.84	.142 0467	138 690.485	.000 0072
11.35	4.910 2124	84495.4 515	0.000 0118	11.85	5.146 3866	140 084.348	0.000 0071
.36	.898 5853	85310.3 685	.000 0117	.86	.150 7336	141 492.218	.000 0071
.37	.902 9283	86136.8 675	.000 0115	.87	.155 0765	142 914.230	.000 0070
.38	.907 2712	86975.0 347	.000 0114	.88	.159 4184	144 350.451	.000 0069
.39	.911 6141	87824.0 574	.000 0113	.89	.163 7614	145 801.398	.000 0069
11.40	4.915 0571	88684.7 234	0.000 0112	11.90	5.168 1043	147 266.625	0.000 0068
.41	.915 3000	89557.0 210	.000 0111	.91	.172 4473	148 746.070	.000 0067
.42	.919 6430	90441.1 610	.000 0110	.92	.176 7902	150 241.568	.000 0067
.43	.923 9859	91336.0 718	.000 0109	.93	.181 1332	151 752.961	.000 0066
.44	.928 3289	92243.0 120	.000 0108	.94	.185 4761	153 276.060	.000 0065
11.45	4.927 6718	93161.3 460	0.000 0106	11.95	5.189 8191	154 817.147	0.000 0065
.46	.931 7148	94091.5 703	.000 0105	.96	.194 7610	156 377.085	.000 0064
.47	.935 7577	95033.8 791	.000 0104	.97	.198 9049	157 944.660	.000 0063
.48	.939 7907	95989.0 698	.000 0103	.98	.203 1479	159 527.031	.000 0063
.49	.943 8236	96957.3 327	.000 0102	.99	.207 3908	161 125.354	.000 0062
11.50	4.994 3855	98715.7 710	0.000 0101	12.00	5.211 5333	162 750.791	0.000 0061
$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}	$\log_{10}(e^x)$	$\log_{10}(e^x)$	e^x	e^{-x}

SMITHSONIAN TABLE.

The Exponential.

x	$\log_e(x)$	e^x	e^{-x}	x	$\log_e(x)$	e^x	e^{-x}
12.00	5.311 5338	162 754.701	0.000 0061	12.50	5.428 6810	268 337.287	0.000 0037
.01	.115 8767	164 302.504	.000 0061	.51	.433 0240	271 036.131	.000 0037
.02	.231 7537	166 042.890	.000 0060	.52	.437 3669	273 758.050	.000 0037
.03	.348 5806	167 711.413	.000 0060	.53	.441 7009	276 500.374	.000 0036
.04	.465 4096	169 396.940	.000 0059	.54	.446 0258	279 268.330	.000 0036
12.05	5.533 2485	171 099.408	0.000 0058	12.55	5.490 3057	282 055.235	0.000 0035
.05	.581 5915	172 818.080	.000 0058	.55	.454 7387	284 830.338	.000 0035
.06	.698 4364	174 555.845	.000 0057	.56	.459 0816	287 703.035	.000 0035
.07	.815 2834	176 312.161	.000 0057	.57	.463 4246	290 686.317	.000 0034
.08	.932 1323	178 082.107	.000 0056	.58	.467 7675	293 680.758	.000 0034
.09	1.049 0030	179 865.862	.000 0056	12.60	5.472 1105	296 558.565	0.000 0034
12.10	5.554 0632	181 670.605	0.000 0055	.61	.476 4534	299 530.628	.000 0033
.11	1.165 9061	183 495.515	.000 0054	.62	.480 7964	302 549.466	.000 0033
.12	1.282 7530	185 340.772	.000 0054	.63	.485 1393	305 591.118	.000 0033
.13	1.399 6039	187 112.107	.000 0053	.64	.489 4823	308 661.350	.000 0032
.14	1.516 4568	188 909.400	0.000 0053	12.65	5.495 8252	311 763.468	0.000 0032
12.15	5.576 6180	190 731.862	.000 0052	.65	.493 8281	314 896.733	.000 0032
.16	1.633 2689	192 580.444	.000 0052	.66	.497 9311	318 061.488	.000 0031
.17	1.750 1198	194 455.266	.000 0051	.67	.502 0340	321 258.059	.000 0031
.18	1.867 0007	196 356.811	.000 0051	.68	.506 1370	324 486.750	.000 0031
.19	1.983 8996	198 284.600	0.000 0050	12.70	5.515 5309	327 747.402	0.000 0031
12.20	5.598 5027	200 239.015	.000 0049	.71	.510 6339	331 041.833	.000 0030
.21	2.100 7356	202 220.498	.000 0049	.72	.514 7368	334 368.840	.000 0030
.22	2.217 5865	204 228.481	.000 0048	.73	.518 8397	337 729.311	.000 0030
.23	2.334 4454	206 262.400	.000 0048	.74	.522 9426	341 123.547	.000 0030
.24	2.451 3123	208 322.280	0.000 0048	12.75	5.537 2546	344 551.896	0.000 0030
12.25	5.620 1054	210 408.580	.000 0047	.75	.527 0475	348 014.700	.000 0030
.26	2.568 1803	212 521.442	.000 0047	.76	.531 1504	351 512.366	.000 0029
.27	2.685 0612	214 660.398	.000 0046	.77	.535 2533	355 045.406	.000 0029
.28	2.802 0001	216 825.200	.000 0046	.78	.539 3562	358 613.526	.000 0029
.29	2.919 0000	219 016.400	0.000 0046	12.80	5.552 0004	362 117.450	0.000 0028
12.30	5.641 8221	221 233.400	.000 0045	.81	.543 1533	365 657.790	.000 0027
.31	3.036 1651	223 476.700	.000 0045	.82	.547 2562	369 234.777	.000 0027
.32	3.153 1100	225 746.800	.000 0044	.83	.551 3591	372 848.613	.000 0027
.33	3.270 0649	228 043.200	.000 0044	.84	.555 4620	376 498.890	.000 0027
.34	3.387 0298	230 366.400	0.000 0043	12.85	5.568 0841	380 188.735	0.000 0026
12.35	5.654 5563	232 716.000	.000 0043	.85	.559 5650	384 015.726	.000 0026
.35	3.504 0000	235 092.000	.000 0042	.86	.563 6679	387 881.178	.000 0026
.36	3.621 0000	237 494.400	.000 0042	.87	.567 7708	391 784.470	.000 0025
.37	3.738 0000	240 023.600	.000 0042	.88	.571 8737	395 725.000	.000 0025
.38	3.855 0000	242 589.200	0.000 0041	12.90	5.580 3088	400 311.191	0.000 0025
.39	3.972 0000	245 191.200	.000 0041	.91	.585 4117	404 335.396	.000 0025
12.40	5.683 2516	247 829.600	.000 0040	.92	.589 5146	408 399.034	.000 0024
.41	4.089 0000	250 506.000	.000 0040	.93	.593 6175	412 502.513	.000 0024
.42	4.206 0000	253 219.600	.000 0040	.94	.597 7204	416 646.343	.000 0024
.43	4.323 0000	255 969.600	0.000 0039	12.95	5.604 1335	421 830.696	0.000 0024
.44	4.440 0000	258 755.600	.000 0039	.95	.601 8264	426 055.115	.000 0024
.45	4.557 0000	261 577.600	.000 0038	.96	.605 9293	430 319.000	.000 0023
.46	4.674 0000	264 435.200	.000 0038	.97	.610 0322	434 622.800	.000 0023
.47	4.791 0000	267 328.800	.000 0038	.98	.614 1351	438 967.000	.000 0023
.48	4.908 0000	270 258.800	.000 0037	.99	.618 2380	443 351.200	.000 0023
.49	5.025 0000	273 224.800	0.000 0037	13.00	5.645 8283	448 775.300	0.000 0023
12.50	5.428 6810	268 337.287	0.000 0037				
$\log_e(x)$	$\log_e(x^2)$	e^x	e^{-x}	$\log_e(x^2)$	$\log_e(x^3)$	e^x	e^{-x}

SMITHSONIAN TABLES.

The Exponential.

u	$\log_{10}(e^u)$	e^u	e^{-u}	u	$\log_{10}(e^u)$	e^u	e^{-u}
13.00	5.645 8281	440 473.392	0.000 0023	13.50	5.882 0755	729 416.370	0.000 0016
.01	.000 2712	446 856.721	.000 0022	.51	.067 3185	736 247.126	.000 0016
.02	.001 5142	454 350.735	.000 0022	.52	.137 1614	744 151.558	.000 0017
.03	.002 8579	462 186.846	.000 0022	.53	.207 0063	752 619.005	.000 0017
.04	.004 2000	470 468.625	.000 0022	.54	.276 8473	759 186.417	.000 0017
13.05	5.669 5430	465 096.412	0.000 0022	13.55	5.884 6902	766 814.367	0.000 0017
.05	.005 5485	470 770.708	.000 0021	.55	.346 6932	774 520.050	.000 0017
.06	.010 2981	478 491.082	.000 0021	.56	.416 5361	782 305.024	.000 0017
.07	.015 0478	487 266.706	.000 0021	.57	.486 3791	790 167.320	.000 0017
.08	.019 7975	496 097.336	.000 0021	.58	.556 2220	798 108.519	.000 0017
.09	.024 5472	505 097.336	0.000 0020	13.60	5.906 4090	806 129.791	0.000 0017
13.10	5.689 0577	498 947.475	0.000 0020	.61	.626 0619	814 231.408	.000 0017
.10	.029 2972	508 810.707	.000 0020	.62	.695 9048	822 414.600	.000 0017
.11	.034 0469	518 691.208	.000 0020	.63	.765 7477	830 678.695	.000 0017
.12	.038 7966	528 588.331	.000 0020	.64	.835 5906	839 123.519	.000 0017
.13	.043 5463	538 501.408	0.000 0019	13.65	5.926 6197	847 760.076	0.000 0017
.14	.048 2960	548 430.881	.000 0019	.65	.905 4336	855 978.030	.000 0017
13.15	5.710 0734	558 376.925	.000 0019	.66	.975 2765	864 380.702	.000 0017
.15	.053 0457	568 339.970	.000 0019	.67	.104 1204	872 979.643	.000 0017
.16	.057 7954	578 319.970	.000 0019	.68	.133 9633	881 766.452	.000 0017
.17	.062 5451	588 316.408	.000 0018	13.70	5.946 8344	890 744.165	0.000 0017
.18	.067 2948	598 329.408	.000 0018	.71	.163 8062	899 814.072	.000 0017
.19	.072 0445	608 358.408	.000 0018	.72	.233 6491	908 984.765	.000 0017
13.20	5.732 6872	618 393.408	.000 0018	.73	.303 4920	918 255.458	.000 0017
.20	.076 7939	628 434.408	.000 0018	.74	.373 3349	927 726.940	.000 0017
13.25	5.754 0910	638 480.408	.000 0018	13.75	5.977 5492	936 597.158	0.000 0017
.21	.081 5436	648 536.408	.000 0017	.75	.443 1778	945 667.650	.000 0017
.22	.086 2933	658 602.408	.000 0017	.76	.513 0207	954 938.142	.000 0017
.23	.091 0430	668 678.408	.000 0017	.77	.582 8636	964 308.634	.000 0017
.24	.095 7927	678 764.408	.000 0017	.78	.652 7065	973 779.126	.000 0017
13.30	5.776 1166	688 860.408	.000 0017	13.80	5.997 7639	983 449.618	0.000 0017
.25	.100 5424	698 966.408	.000 0017	.81	.722 5498	993 220.110	.000 0017
.26	.105 2921	709 082.408	.000 0016	.82	.792 3927	1003 090.602	.000 0017
.27	.110 0418	719 208.408	.000 0016	.83	.862 2356	1013 061.094	.000 0017
.28	.114 7915	729 344.408	.000 0016	13.85	6.017 9786	1023 131.586	0.000 0017
.29	.119 5412	739 490.408	.000 0016	.84	.932 0785	1033 302.078	.000 0017
13.35	5.797 1413	749 646.408	.000 0016	.85	.101 9214	1043 572.570	.000 0017
.30	.124 2909	759 812.408	.000 0016	.86	.171 7643	1053 943.062	.000 0017
.31	.129 0406	769 988.408	.000 0016	.87	.241 6072	1064 413.554	.000 0017
.32	.133 7903	780 174.408	.000 0016	.88	.311 4501	1074 984.046	.000 0017
.33	.138 5400	790 370.408	.000 0016	13.90	6.038 2237	1085 654.538	0.000 0017
.34	.143 2897	800 576.408	.000 0016	.89	.381 2930	1096 425.030	.000 0017
13.40	5.818 2668	810 792.408	.000 0016	.90	.451 1359	1107 295.522	.000 0017
.35	.148 0394	821 018.408	.000 0016	13.95	6.058 4080	1118 266.014	0.000 0017
.36	.152 7891	831 254.408	.000 0016	.91	.520 9789	1129 336.506	.000 0017
.37	.157 5388	841 500.408	.000 0016	.92	.590 8198	1140 507.000	.000 0017
.38	.162 2885	851 756.408	.000 0016	.93	.660 6607	1151 777.494	.000 0017
.39	.167 0382	862 022.408	.000 0016	.94	.730 5016	1163 147.988	.000 0017
13.45	5.838 4668	872 298.408	.000 0016	13.99	6.078 5930	1174 618.482	0.000 0017
.40	.171 7879	882 584.408	.000 0016	.95	.800 3425	1186 188.976	.000 0017
.41	.176 5376	892 880.408	.000 0016	.96	.870 1834	1197 859.470	.000 0017
.42	.181 2873	903 186.408	.000 0016	14.00	6.098 6782	1209 630.964	0.000 0017
.43	.186 0370	913 502.408	.000 0016				
.44	.190 7867	923 828.408	.000 0016				
13.50	5.858 6668	924 164.408	.000 0016				
.45	.195 5364	934 164.408	.000 0016				
.46	.200 2861	944 164.408	.000 0016				
.47	.205 0358	954 164.408	.000 0016				
.48	.209 7855	964 164.408	.000 0016				
.49	.214 5352	974 164.408	.000 0016				
13.55	5.878 8668	984 164.408	.000 0016				
.50	.219 2849	994 164.408	.000 0016				
13.60	5.898 0668	994 164.408	.000 0016				
.51	.224 0346	1004 164.408	.000 0016				
.52	.228 7843	1014 164.408	.000 0016				
.53	.233 5340	1024 164.408	.000 0016				
.54	.238 2837	1034 164.408	.000 0016				
.55	.243 0334	1044 164.408	.000 0016				
.56	.247 7831	1054 164.408	.000 0016				
.57	.252 5328	1064 164.408	.000 0016				
.58	.257 2825	1074 164.408	.000 0016				
.59	.262 0322	1084 164.408	.000 0016				
13.65	5.918 0668	1094 164.408	.000 0016				
.60	.266 7819	1104 164.408	.000 0016				
.61	.271 5316	1114 164.408	.000 0016				
.62	.276 2813	1124 164.408	.000 0016				
.63	.281 0310	1134 164.408	.000 0016				
.64	.285 7807	1144 164.408	.000 0016				
.65	.290 5304	1154 164.408	.000 0016				
.66	.295 2801	1164 164.408	.000 0016				
.67	.300 0298	1174 164.408	.000 0016				
.68	.304 7795	1184 164.408	.000 0016				
.69	.309 5292	1194 164.408	.000 0016				
13.70	5.938 0668	1204 164.408	.000 0016				
.70	.314 2789	1214 164.408	.000 0016				
.71	.319 0286	1224 164.408	.000 0016				
.72	.323 7783	1234 164.408	.000 0016				
.73	.328 5280	1244 164.408	.000 0016				
.74	.333 2777	1254 164.408	.000 0016				
.75	.338 0274	1264 164.408	.000 0016				
.76	.342 7771	1274 164.408	.000 0016				
.77	.347 5268	1284 164.408	.000 0016				
.78	.352 2765	1294 164.408	.000 0016				
.79	.357 0262	1304 164.408	.000 0016				
13.75	5.958 0668	1314 164.408	.000 0016				
.80	.361 7759	1324 164.408	.000 0016				
.81	.366 5256	1334 164.408	.000 0016				
.82	.371 2753	1344 164.408	.000 0016				
.83	.376 0250	1354 164.408	.000 0016				
.84	.380 7747	1364 164.408	.000 0016				
.85	.385 5244	1374 164.408	.000 0016				
.86	.390 2741	1384 164.408	.000 0016				
.87	.395 0238	1394 164.408	.000 0016				
.88	.399 7735	1404 164.408	.000 0016				
.89	.404 5232	1414 164.408	.000 0016				
13.80	5.978 0668	1424 164.408	.000 0016				
.90	.409 2729	1434 164.408	.000 0016				
.91	.414 0226	1444 164.408	.000 0016				
.92	.418 7723	1454 164.408	.000 0016				
.93	.423 5220	1464 164.408	.000 0016				
.94	.428 2717	1474 164.408	.000 0016				
.95	.433 0214	1484 164.408	.000 0016				
.96	.437 7711	1494 164.408	.000 0016				
.97	.442 5208	1504 164.408	.000 0016				
.98	.447 2705	1514 164.408	.000 0016				
.99	.452 0202	1524 164.408	.000 0016				
13.85	5.998 0668	1534 164.408	.000 0016				
.99	.456 7699	1544 164.408	.000 0016				
13.90	6.018 0668	1554 164.408	.000 0016				
.99	.461 5196	1564 164.408	.000 0016				
13.95	6.038 0668	1574 164.408	.000 0016				
.99	.466 2693	1584 164.408	.000 0016				
14.00	6.058 0668	1594 164.408	.000 0016				
.99	.471 0190	1604 164.408	.000 0016				
14.05	6.078 0668	1614 164.408	.000 0016				
.99	.475 7687	1624 164.408	.000 0016				
14.10	6.098 0668	1634 164.408	.000 0016				
.99	.480 5184	1644 164.408	.000 0016				
14.15	6.118 0668	1654 164.408	.000 0016				
.99	.485 2681	1664 164.408	.000 0016				
14.20	6.138 0668	1674 164.408	.000 0016				
.99	.490 0178	1684 164.408	.000 0016				
14.25	6.158 0668	1694 164.408	.000 0016				
.99	.494 7675	1704 164.408	.000 0016				
14.30	6.178 0668	1714 164.408	.000 0016				
.99	.499 5172	1724 164.408	.000 0016				
14.35	6.198 0668	1734 164.408	.000 0016				
.99	.504 2669	1744 164.408	.000 0016				
14.40	6.218 0668	1754 164.408	.000 0016				
.99	.509 0166	1764 164.408	.000 0016				
14.45	6.238 0668	1774 164.408	.000 0016				
.99	.513 7663	1784 164.408	.000 0016				
14.50	6.258 0668	1794 164.408	.000 0016				
.99	.518 5160	1804 164.408	.000 0016				
14.55	6.278 0668	1814 164.408	.000 0016				

The Exponential.

n	$\log_e(e^n)$	e^n	e^{-n}	n	$\log_e(e^n)$	e^n	e^{-n}
14.00	6.280 1227	120 2644.28	0.000 0008	14.50	6.307 3700	198 2759.26	0.000 0005
.01	.024 4637	121 2660.60	.000 0008	.51	.301 6120	200 2806.33	.000 0005
.02	.048 8286	122 6802.50	.000 0008	.52	.305 9559	202 2853.60	.000 0005
.03	.073 1516	123 0210.04	.000 0008	.53	.310 2988	204 2901.27	.000 0005
.04	.097 4045	123 1083.50	.000 0008	.54	.314 6418	206 2977.30	.000 0005
14.05	6.101 8375	126 4263.12	0.000 0008	14.55	6.318 9847	208 3417.50	0.000 0005
.06	.106 1804	127 6669.18	.000 0008	.56	.319 3977	210 3516.25	.000 0005
.07	.110 5734	128 9802.93	.000 0008	.57	.323 0706	212 3553.53	.000 0005
.08	.114 8603	130 2765.67	.000 0008	.58	.327 0135	214 3787.47	.000 0005
.09	.119 2007	131 5858.68	.000 0008	.59	.330 3565	216 3968.20	.000 0005
14.10	6.123 5572	132 0083.08	0.000 0008	14.60	6.340 6904	219 1287.88	0.000 0005
.11	.127 8651	134 2440.70	.000 0007	.61	.345 0434	221 3310.68	.000 0005
.12	.132 9181	135 5033.54	.000 0007	.62	.349 3853	223 3554.83	.000 0004
.13	.136 5830	136 9559.80	.000 0007	.63	.353 7283	225 3822.53	.000 0004
.14	.140 9240	138 3324.10	.000 0007	.64	.358 0712	228 0716.03	.000 0004
14.15	6.145 3669	139 7226.84	0.000 0007	14.65	6.362 4147	230 3637.61	0.000 0004
.16	.149 6090	141 1160.20	.000 0007	.66	.366 7571	232 3780.55	.000 0004
.17	.153 9128	142 5452.69	.000 0007	.67	.371 1000	235 0174.17	.000 0004
.18	.158 2054	143 0778.73	.000 0007	.68	.375 4430	237 3793.82	.000 0004
.19	.162 6387	145 4248.75	.000 0007	.69	.379 7859	239 7650.84	.000 0004
14.20	6.166 9826	146 8864.70	0.000 0007	14.70	6.384 2280	242 1747.63	0.000 0004
.21	.171 3246	148 3626.52	.000 0007	.71	.388 4718	244 6086.60	.000 0004
.22	.175 8672	149 8537.61	.000 0007	.72	.392 8148	247 0670.18	.000 0004
.23	.180 0105	151 3597.76	.000 0007	.73	.397 1577	249 5500.83	.000 0004
.24	.184 3534	152 8809.67	.000 0007	.74	.401 5007	252 0581.03	.000 0004
14.25	6.188 6964	154 4174.47	0.000 0006	14.75	6.405 8136	254 5913.30	0.000 0004
.26	.193 0303	155 9695.08	.000 0006	.76	.410 1866	257 1500.14	.000 0004
.27	.197 3823	157 5368.86	.000 0006	.77	.414 5295	259 7344.15	.000 0004
.28	.201 7252	159 1090.58	.000 0006	.78	.418 8724	262 3447.80	.000 0004
.29	.206 0681	160 7103.42	.000 0006	.79	.423 2154	264 9813.98	.000 0004
14.30	6.210 4111	162 3345.90	0.000 0006	14.80	6.427 5582	267 6445.66	0.000 0004
.31	.214 7540	163 9660.88	.000 0006	.81	.427 9013	270 3343.78	.000 0004
.32	.219 0970	165 6139.75	.000 0006	.82	.432 2442	273 0512.83	.000 0004
.33	.223 4399	167 2784.23	.000 0006	.83	.436 5872	275 7954.04	.000 0004
.34	.227 7830	168 9595.99	.000 0006	.84	.440 9301	278 5673.85	.000 0004
14.35	6.232 1258	170 6576.71	0.000 0006	14.85	6.440 2731	281 3669.33	0.000 0004
.36	.236 4688	172 3728.09	.000 0006	.86	.445 0160	284 1947.77	.000 0004
.37	.240 8117	174 1051.85	.000 0006	.87	.449 3589	287 0590.32	.000 0004
.38	.245 1546	175 8549.41	.000 0006	.88	.453 7019	289 9556.32	.000 0004
.39	.249 4976	177 6223.43	.000 0006	.89	.458 0448	292 8847.35	.000 0003
14.40	6.253 8905	179 4074.77	0.000 0006	14.90	6.470 6878	295 7920.24	0.000 0003
.41	.258 1835	181 2105.52	.000 0006	.91	.475 1907	298 7693.92	.000 0003
.42	.262 5264	183 0317.49	.000 0005	.92	.479 6737	301 7683.37	.000 0003
.43	.266 8694	184 8712.48	.000 0005	.93	.484 0166	304 8011.60	.000 0003
.44	.271 2123	186 7302.53	.000 0005	.94	.488 3596	307 8644.62	.000 0003
14.45	6.275 5553	188 6098.95	0.000 0005	14.95	6.492 7023	310 9685.51	0.000 0003
.46	.279 8582	190 5014.16	.000 0005	.96	.497 0454	314 0837.37	.000 0003
.47	.284 2112	192 4150.87	.000 0005	.97	.501 3884	317 2493.31	.000 0003
.48	.288 5541	194 3493.08	.000 0005	.98	.505 7313	320 4286.40	.000 0003
.49	.292 9070	196 3030.45	.000 0005	.99	.510 0743	323 6299.11	.000 0003
14.50	6.307 2700	198 2759.26	0.000 0005	15.00	6.514 4172	326 9917.37	0.000 0003
$\log_e(e^n)$	$\log_e(e^n)$	e^n	e^{-n}	$\log_e(e^n)$	$\log_e(e^n)$	e^n	e^{-n}

SMITHSONIAN TABLES.

The Exponential.

n	$10^{10}(e^n)$	e^n	e^{-n}
1	.43429 44810	2.71 828 183	0.367 879 441
2	.86858 89638	7.38 905 610	0.135 335 283
3	1.30288 34452	20.0 855 350	(1) .047 870 684
4	1.73717 79070	54.5 981 500	(1) .018 315 380
5	2.17147 24095	148. 413 150	(2) .007 370 700
6	2.60576 68914	403. 448 793	(2) .002 875 218
7	3.04005 13731	109 6.63 316	(3) .001 221 950
8	3.47435 58552	298 0.95 799	(3) .000 452 638
9	3.90865 03171	810 3.08 393	(3) .000 123 409
10	4.34294 48150	220 26.4 058	(4) .000 033 900
11	4.77723 93069	598 74.1 417	(4) .000 009 017
12	5.21153 37828	162 751. 704	(5) .000 002 425
13	5.64582 82647	442 413. 392	(5) .000 000 611
14	6.08012 27466	120 260 4.38	(6) .000 000 170
15	6.51441 72285	326 901 7.37	(6) .000 000 047
16	6.94871 17105	888 611 0.52	(6) .000 000 013
17	7.38300 61924	241 540 52.8	(7) .000 000 003
18	7.81730 06743	656 599 09.1	(7) .000 000 000
19	8.25159 51562	178 482 301.	(8) .000 000 000
20	8.68588 96381	485 165 105.	(8) .000 000 000
21	9.12018 41200	131 881 573 [1]	(9) .000 000 000
22	9.55447 86019	358 491 285 [1]	(9) .000 000 000
23	9.98877 30838	974 480 345 [1]	(9) .000 000 000
24	10.42306 75657	264 891 221 2	(10) .000 000 000
25	10.85736 20476	720 028 993 2	(10) .000 000 000
26	11.29165 65295	195 722 009 3	(11) .000 000 000
27	11.72595 10114	532 028 241 3	(11) .000 000 000
28	12.16024 54933	144 625 706 4	(12) .000 000 000
29	12.59453 99752	391 133 430 4	(12) .000 000 000
30	13.02883 44571	100 801 746 5	(13) .000 000 000
31	13.46312 89390	260 488 457 5	(13) .000 000 000
32	13.89742 34209	789 609 602 6	(13) .000 000 000
33	14.33171 79028	214 643 880 6	(14) .000 000 000
34	14.76601 23847	583 491 743 6	(14) .000 000 000
35	15.20030 68666	158 601 345 7	(15) .000 000 000
36	15.63460 13485	431 123 155 7	(15) .000 000 000
37	16.06889 58304	117 161 424 8	(16) .000 000 000
38	16.50319 03123	318 559 348 8	(16) .000 000 000
39	16.93748 47942	865 914 094 8	(16) .000 000 000
40	17.37177 92761	235 385 307 9	(17) .000 000 000
41	17.80607 37580	629 843 424 9	(17) .000 000 000
42	18.24036 82399	173 927 493 10	(18) .000 000 000
43	18.67466 27218	472 783 547 10	(18) .000 000 000
44	19.10895 72037	128 516 001 11	(19) .000 000 000
45	19.54325 16856	349 342 711 11	(19) .000 000 000
46	19.97754 61675	949 611 942 11	(19) .000 000 000
47	20.41184 06495	258 131 289 12	(20) .000 000 000
48	20.84613 51314	701 673 591 12	(20) .000 000 000
49	21.28042 96133	192 734 667 13	(21) .000 000 000
50	21.71472 40952	518 470 553 13	(21) .000 000 000

The numbers in square brackets denote the numbers of figures between the last figure given and the decimal point; for example, the first nine figures of e^6 are 518.470553, and there are 13 additional figures before the decimal point is reached. The numbers in parentheses denote the numbers of ciphers between the decimal point and the first significant figure; for example, in e^{-10} there are 21 ciphers between the decimal point and the figures .02874685.

The Exponential.

x	$\log_e(x)$	e^x	e^{-x}
51	22.14961 85771	120 034 908 [14]	(22) 799 547 416
52	22.58331 10599	383 100 800 [14]	(22) 261 027 907
53	23.04700 75409	804 137 504 [15]	(23) 950 268 005
54	23.45190 20228	283 075 330 [15]	(23) 353 265 857
55	23.88049 65047	769 478 557 [15]	(23) 129 058 143
56	24.32040 06805	209 165 050 [16]	(24) 478 089 288
57	24.75478 54685	578 572 000 [16]	(24) 175 879 220
58	25.18907 99094	154 553 894 [17]	(25) 647 023 401
59	25.62337 14313	420 121 010 [17]	(25) 238 026 641
60	26.05766 80112	114 200 730 [18]	(26) 875 651 076
61	26.49196 33951	310 429 704 [18]	(26) 323 134 029
62	26.92625 78780	813 835 607 [18]	(26) 118 505 486
63	27.36055 23509	229 378 310 [19]	(27) 435 061 000
64	27.79484 68418	623 544 908 [19]	(27) 160 281 089
65	28.22914 13437	169 488 034 [20]	(28) 590 009 054
66	28.66343 58056	460 718 063 [20]	(28) 217 052 201
67	29.09773 03075	125 295 317 [21]	(29) 798 490 445
68	29.53202 47694	340 427 605 [21]	(29) 293 798 211
69	29.96631 92313	925 378 173 [21]	(29) 108 003 998
70	30.40061 37332	251 543 807 [22]	(30) 397 544 974
71	30.83490 82151	683 767 123 [22]	(30) 146 248 023
72	31.26920 26970	188 807 175 [23]	(31) 538 018 610
73	31.70349 71789	505 299 361 [23]	(31) 192 028 688
74	32.13779 16608	137 336 298 [24]	(32) 728 129 018
75	32.57208 61427	373 324 200 [24]	(32) 267 893 696
76	33.00638 06246	101 480 039 [25]	(33) 985 415 459
77	33.44067 51065	275 851 345 [25]	(33) 362 514 002
78	33.87496 95884	740 841 700 [25]	(33) 133 361 482
79	34.30926 40703	203 828 107 [26]	(34) 490 609 473
80	34.74355 85522	554 068 238 [26]	(34) 180 498 139
81	35.17785 30341	150 609 731 [27]	(35) 663 077 720
82	35.61214 75161	409 399 666 [27]	(35) 244 200 074
83	36.04644 19980	111 286 375 [28]	(36) 898 582 504
84	36.48073 64799	302 507 732 [28]	(36) 330 570 008
85	36.91503 09618	822 301 271 [28]	(36) 121 009 930
86	37.34932 54437	213 524 660 [29]	(37) 447 327 931
87	37.78361 99256	607 603 033 [29]	(37) 164 581 143
88	38.21791 44075	165 163 625 [30]	(38) 605 460 190
89	38.65220 88894	448 961 282 [30]	(38) 222 736 356
90	39.08650 33713	122 040 320 [31]	(39) 819 401 262
91	39.52079 78532	331 740 010 [31]	(39) 301 440 879
92	39.95509 23351	991 762 841 [31]	(39) 110 803 902
93	40.38938 68170	245 124 554 [32]	(40) 407 955 897
94	40.82368 12989	660 317 622 [32]	(40) 150 078 576
95	41.25797 57808	181 123 008 [33]	(41) 552 108 228
96	41.69227 02627	499 345 839 [33]	(41) 203 109 266
97	42.12656 47446	135 813 478 [34]	(42) 747 107 234
98	42.56085 92265	373 797 095 [34]	(42) 274 898 991
99	42.99515 37084	988 003 032 [34]	(42) 101 122 149
100	43.42944 81903	268 811 714 [35]	(43) 372 007 598

The numbers in square brackets denote the numbers of figures between the last figure given and the decimal point; for example, the first nine figures of e^9 are 518.00553, and there are 13 additional figures before the decimal point is reached. The numbers in parentheses denote the numbers of ciphers between the decimal point and the first significant figure; for example, in e^{-28} there are 21 ciphers between the decimal point and the figures 190874985.

Auxiliary Table for Interpolation of Log_e(e^x).

(p = 10 × 43429 4489 . . .)

x	y	z	t	u	v	w	x	y	z
0.000	000	0.050	2171	0.100	4343	0.150	6814	0.200	8686
.001	043	.051	2185	.101	4380	.151	6858	.201	8729
.002	087	.052	2198	.102	4410	.152	6901	.202	8773
.003	130	.053	2212	.103	4443	.153	6945	.203	8816
.004	174	.054	2245	.104	4477	.154	6988	.204	8860
0.005	217	0.055	2289	0.105	4500	0.155	6933	0.205	8903
.006	261	.056	2322	.106	4534	.156	6975	.206	8946
.007	304	.057	2355	.107	4567	.157	7018	.207	8989
.008	347	.058	2389	.108	4600	.158	7061	.208	9033
.009	391	.059	2422	.109	4634	.159	7105	.209	9077
0.010	434	0.060	2466	0.110	4677	0.160	7148	0.210	9120
.011	478	.061	2500	.111	4711	.161	7192	.211	9164
.012	521	.062	2533	.112	4744	.162	7235	.212	9207
.013	565	.063	2576	.113	4788	.163	7279	.213	9250
.014	608	.064	2619	.114	4831	.164	7322	.214	9294
0.015	651	0.065	2663	0.115	4874	0.165	7366	0.215	9337
.016	695	.066	2706	.116	4918	.166	7409	.216	9381
.017	738	.067	2749	.117	4961	.167	7453	.217	9424
.018	782	.068	2793	.118	5005	.168	7496	.218	9468
.019	825	.069	2837	.119	5048	.169	7540	.219	9511
0.020	869	0.070	2880	0.120	5092	0.170	7583	0.220	9554
.021	912	.071	2924	.121	5135	.171	7627	.221	9598
.022	955	.072	2967	.122	5179	.172	7670	.222	9641
.023	999	.073	3011	.123	5222	.173	7714	.223	9685
.024	1042	.074	3054	.124	5266	.174	7757	.224	9728
0.025	1086	0.075	3098	0.125	5309	0.175	7801	0.225	9772
.026	1129	.076	3141	.126	5353	.176	7844	.226	9815
.027	1173	.077	3185	.127	5396	.177	7888	.227	9858
.028	1216	.078	3228	.128	5440	.178	7931	.228	9902
.029	1259	.079	3272	.129	5483	.179	7975	.229	9945
0.030	1303	0.080	3315	0.130	5527	0.180	8017	0.230	9989
.031	1346	.081	3359	.131	5570	.181	8061	.231	10032
.032	1390	.082	3402	.132	5614	.182	8104	.232	10076
.033	1433	.083	3446	.133	5657	.183	8148	.233	10119
.034	1477	.084	3489	.134	5701	.184	8191	.234	10163
0.035	1520	0.085	3533	0.135	5744	0.185	8235	0.235	10206
.036	1564	.086	3576	.136	5788	.186	8278	.236	10249
.037	1607	.087	3620	.137	5831	.187	8322	.237	10293
.038	1651	.088	3663	.138	5875	.188	8365	.238	10336
.039	1694	.089	3707	.139	5918	.189	8409	.239	10380
0.040	1737	0.090	3750	0.140	5962	0.190	8452	0.240	10423
.041	1781	.091	3794	.141	6005	.191	8496	.241	10467
.042	1824	.092	3837	.142	6049	.192	8539	.242	10510
.043	1867	.093	3881	.143	6092	.193	8583	.243	10554
.044	1911	.094	3924	.144	6136	.194	8626	.244	10597
0.045	1954	0.095	3968	0.145	6179	0.195	8670	0.245	10641
.046	1998	.096	4011	.146	6223	.196	8713	.246	10684
.047	2041	.097	4055	.147	6266	.197	8757	.247	10727
.048	2085	.098	4098	.148	6310	.198	8800	.248	10771
.049	2128	.099	4142	.149	6353	.199	8844	.249	10814
0.050	2171	0.100	4185	0.150	6397	0.200	8887	0.250	10857
x	y	z	t	u	v	w	x	y	z

Auxiliary Table for Interpolation of $\text{Log}_n(e^x)$.

(p = n X 43429 44819 . . .)

n	p	n	p	n	p	n	p	n	p
0.250	10857	0.300	13029	0.350	15200	0.400	17372	0.450	19543
.251	10901	.301	13072	.351	15244	.401	17415	.451	19587
.252	10944	.302	13115	.352	15287	.402	17458	.452	19630
.253	10988	.303	13159	.353	15331	.403	17502	.453	19674
.254	11031	.304	13203	.354	15374	.404	17545	.454	19717
0.255	11075	0.305	13246	0.355	15417	0.405	17589	0.455	19760
.256	11118	.306	13289	.356	15461	.406	17632	.456	19804
.257	11161	.307	13331	.357	15504	.407	17675	.457	19847
.258	11205	.308	13375	.358	15548	.408	17719	.458	19891
.259	11248	.309	13420	.359	15591	.409	17763	.459	19934
0.260	11290	0.310	13463	0.360	15635	0.410	17806	0.460	19978
.261	11335	.311	13507	.361	15678	.411	17850	.461	20021
.262	11379	.312	13550	.362	15721	.412	17893	.462	20064
.263	11422	.313	13593	.363	15765	.413	17936	.463	20108
.264	11465	.314	13637	.364	15808	.414	17980	.464	20151
0.265	11509	0.315	13680	0.365	15852	0.415	18023	0.465	20195
.266	11552	.316	13724	.366	15895	.416	18067	.466	20238
.267	11596	.317	13767	.367	15939	.417	18110	.467	20282
.268	11639	.318	13811	.368	15982	.418	18154	.468	20325
.269	11683	.319	13854	.369	16025	.419	18197	.469	20368
0.270	11726	0.320	13897	0.370	16069	0.420	18240	0.470	20412
.271	11769	.321	13941	.371	16112	.421	18284	.471	20455
.272	11813	.322	13984	.372	16155	.422	18327	.472	20499
.273	11856	.323	14028	.373	16199	.423	18371	.473	20542
.274	11900	.324	14071	.374	16243	.424	18414	.474	20586
0.275	11943	0.325	14115	0.375	16286	0.425	18458	0.475	20629
.276	11987	.326	14158	.376	16329	.426	18501	.476	20672
.277	12030	.327	14201	.377	16373	.427	18545	.477	20716
.278	12073	.328	14245	.378	16416	.428	18588	.478	20759
.279	12117	.329	14288	.379	16460	.429	18631	.479	20803
0.280	12160	0.330	14332	0.380	16503	0.430	18675	0.480	20846
.281	12204	.331	14375	.381	16547	.431	18718	.481	20890
.282	12247	.332	14419	.382	16590	.432	18762	.482	20933
.283	12291	.333	14462	.383	16633	.433	18805	.483	20977
.284	12334	.334	14505	.384	16677	.434	18848	.484	21020
0.285	12377	0.335	14549	0.385	16720	0.435	18892	0.485	21063
.286	12421	.336	14592	.386	16764	.436	18935	.486	21107
.287	12464	.337	14636	.387	16807	.437	18979	.487	21150
.288	12508	.338	14679	.388	16851	.438	19022	.488	21194
.289	12551	.339	14723	.389	16894	.439	19065	.489	21237
0.290	12595	0.340	14766	0.390	16937	0.440	19109	0.490	21280
.291	12638	.341	14809	.391	16981	.441	19152	.491	21324
.292	12681	.342	14853	.392	17024	.442	19196	.492	21367
.293	12725	.343	14896	.393	17068	.443	19239	.493	21411
.294	12768	.344	14940	.394	17111	.444	19283	.494	21454
0.295	12812	0.345	14983	0.395	17155	0.445	19326	0.495	21498
.296	12855	.346	15027	.396	17198	.446	19370	.496	21541
.297	12899	.347	15070	.397	17241	.447	19413	.497	21584
.298	12942	.348	15113	.398	17285	.448	19456	.498	21628
.299	12985	.349	15157	.399	17328	.449	19500	.499	21671
0.300	13029	0.350	15200	0.400	17372	0.450	19543	0.500	21715
n	p	n	p	n	p	n	p	n	p

TABLE V

NATURAL LOGARITHMS

NOTE.—In Table V, for n greater than 158, linear interpolation of $\log_e n$ suffices to give a value whose error is not greater than one unit in the last place.

Natural Logarithms.

u	log. u	u F ₁	u	log. u	u F ₁	u	log. u	u F ₁	u	log. u	u F ₁
0	—00	40	50	3.01030	2000	100	4.60517	1000	150	5.01064	667
1	0.00000	100000	51	3.02183	1001	101	4.61512	990	151	5.01728	668
2	0.00015	90000	52	3.03124	1002	102	4.62407	980	152	5.02388	669
3	1.00030	80000	53	3.04029	1003	103	4.63243	970	153	5.03044	670
4	1.38020	70000	54	3.04888	1004	104	4.64030	960	154	5.03695	671
5	1.69044	60000	55	4.00733	1005	105	4.64766	950	155	5.04343	672
6	1.79176	50000	56	4.00535	1280	106	4.65444	940	156	5.04980	673
7	1.84391	42886	57	4.04305	1254	107	4.66123	930	157	5.05615	674
8	2.07944	12500	58	4.06044	1244	108	4.66813	920	158	5.06250	675
9	2.19722	11171	59	4.07754	1095	109	4.67515	910	159	5.06880	676
10	2.30229	10000	60	4.09434	1067	110	4.70048	900	160	5.07517	677
11	2.30790	9001	61	4.11087	1039	111	4.70653	890	161	5.08149	678
12	2.34401	8333	62	4.12713	1013	112	4.71259	880	162	5.08780	679
13	2.35405	7992	63	4.14313	1587	113	4.72730	870	163	5.09415	680
14	2.35966	7143	64	4.15888	1568	114	4.73302	860	164	5.09987	681
15	2.36885	6667	65	4.17430	1538	115	4.74403	850	165	5.10595	682
16	2.37740	6250	66	4.18965	1515	116	4.75359	840	166	5.11190	683
17	2.38491	5882	67	4.20490	1403	117	4.76117	830	167	5.11799	684
18	2.39037	5456	68	4.21951	1471	118	4.77008	820	168	5.12390	685
19	2.39444	5063	69	4.23411	1449	119	4.77912	810	169	5.12980	686
20	2.39957	9000	70	4.24850	1420	120	4.78749	800	170	5.13580	687
21	2.40457	4769	71	4.26268	1408	121	4.79579	790	171	5.14166	688
22	2.409104	4545	72	4.27667	1380	122	4.80392	780	172	5.14750	689
23	2.41350	4348	73	4.29045	1370	123	4.81218	770	173	5.15320	690
24	2.41785	4107	74	4.30407	1351	124	4.82028	760	174	5.15900	691
25	2.42188	4000	75	4.31740	1333	125	4.82831	750	175	5.16470	692
26	2.42580	3846	76	4.33073	1316	126	4.83598	740	176	5.17048	693
27	2.429584	3704	77	4.34381	1299	127	4.84419	730	177	5.17615	694
28	2.43320	3571	78	4.35671	1282	128	4.85203	720	178	5.18178	695
29	2.436730	3448	79	4.36945	1266	129	4.85981	710	179	5.18739	696
30	2.440130	3333	80	4.38203	1250	130	4.86753	700	180	5.19296	697
31	2.443390	3226	81	4.39445	1235	131	4.87520	690	181	5.19850	698
32	2.446571	3125	82	4.40672	1220	132	4.88280	680	182	5.20401	699
33	2.449651	3030	83	4.41884	1205	133	4.89035	670	183	5.20949	700
34	2.452636	2941	84	4.43082	1190	134	4.89784	660	184	5.21494	701
35	2.455535	2857	85	4.44265	1176	135	4.90527	650	185	5.22035	702
36	2.458359	2778	86	4.45435	1163	136	4.91265	640	186	5.22575	703
37	2.461099	2703	87	4.46592	1150	137	4.91998	630	187	5.23111	704
38	2.463759	2632	88	4.47734	1136	138	4.92725	620	188	5.23644	705
39	2.466336	2564	89	4.48864	1124	139	4.93447	610	189	5.24175	706
40	2.468838	2500	90	4.49981	1111	140	4.94164	600	190	5.24702	707
41	2.471257	2439	91	4.51086	1099	141	4.94876	590	191	5.25227	708
42	2.473597	2381	92	4.52179	1087	142	4.95583	580	192	5.25750	709
43	2.475850	2326	93	4.53260	1075	143	4.96284	570	193	5.26270	710
44	2.478019	2273	94	4.54329	1064	144	4.96981	560	194	5.26789	711
45	2.480166	2222	95	4.55388	1053	145	4.97673	550	195	5.27300	712
46	2.482281	2174	96	4.56435	1042	146	4.98361	540	196	5.27811	713
47	2.484363	2128	97	4.57471	1031	147	4.99043	530	197	5.28320	714
48	2.486410	2083	98	4.58497	1020	148	4.99721	520	198	5.28827	715
49	2.488432	2041	99	4.59512	1010	149	5.00395	510	199	5.29330	716
50	2.491202	2000	100	4.60517	1000	150	5.01064	500	200	5.29832	717
e ^x	x	e ^{-x}	e ^x	x	e ^{-x}	e ^x	x	e ^{-x}	e ^x	x	e ^{-x}

Natural Logarithms.

α	$\log \alpha$	$\alpha - F'$	α	$\log \alpha$	$\alpha - F'$	α	$\log \alpha$	$\alpha - F'$	α	$\log \alpha$	$\alpha - F'$
290	5.46132	900	290	5.46132	900	300	5.70378	333	350	5.85701	285
291	5.46133	498	291	5.46133	498	301	5.70711	332	351	5.86070	286
292	5.46134	905	292	5.46134	905	302	5.71043	331	352	5.86439	287
293	5.46135	493	293	5.46135	493	303	5.71375	330	353	5.86807	288
294	5.46136	900	294	5.46136	900	304	5.71707	329	354	5.87176	289
295	5.46137	498	295	5.46137	498	305	5.72039	328	355	5.87544	290
296	5.46138	905	296	5.46138	905	306	5.72371	327	356	5.87912	291
297	5.46139	493	297	5.46139	493	307	5.72703	326	357	5.88280	292
298	5.46140	900	298	5.46140	900	308	5.73035	325	358	5.88648	293
299	5.46141	498	299	5.46141	498	309	5.73367	324	359	5.89016	294
300	5.46142	905	300	5.46142	905	310	5.73699	323	360	5.89384	295
301	5.46143	493	301	5.46143	493	311	5.74031	322	361	5.89752	296
302	5.46144	900	302	5.46144	900	312	5.74363	321	362	5.90120	297
303	5.46145	498	303	5.46145	498	313	5.74695	320	363	5.90488	298
304	5.46146	905	304	5.46146	905	314	5.75027	319	364	5.90856	299
305	5.46147	493	305	5.46147	493	315	5.75359	318	365	5.91224	300
306	5.46148	900	306	5.46148	900	316	5.75691	317	366	5.91592	301
307	5.46149	498	307	5.46149	498	317	5.76023	316	367	5.91960	302
308	5.46150	905	308	5.46150	905	318	5.76355	315	368	5.92328	303
309	5.46151	493	309	5.46151	493	319	5.76687	314	369	5.92696	304
310	5.46152	900	310	5.46152	900	320	5.77019	313	370	5.93064	305
311	5.46153	498	311	5.46153	498	321	5.77351	312	371	5.93432	306
312	5.46154	905	312	5.46154	905	322	5.77683	311	372	5.93800	307
313	5.46155	493	313	5.46155	493	323	5.78015	310	373	5.94168	308
314	5.46156	900	314	5.46156	900	324	5.78347	309	374	5.94536	309
315	5.46157	498	315	5.46157	498	325	5.78679	308	375	5.94904	310
316	5.46158	905	316	5.46158	905	326	5.79011	307	376	5.95272	311
317	5.46159	493	317	5.46159	493	327	5.79343	306	377	5.95640	312
318	5.46160	900	318	5.46160	900	328	5.79675	305	378	5.96008	313
319	5.46161	498	319	5.46161	498	329	5.79999	304	379	5.96376	314
320	5.46162	905	320	5.46162	905	330	5.80331	303	380	5.96744	315
321	5.46163	493	321	5.46163	493	331	5.80663	302	381	5.97112	316
322	5.46164	900	322	5.46164	900	332	5.80995	301	382	5.97480	317
323	5.46165	498	323	5.46165	498	333	5.81327	300	383	5.97848	318
324	5.46166	905	324	5.46166	905	334	5.81659	299	384	5.98216	319
325	5.46167	493	325	5.46167	493	335	5.81991	298	385	5.98584	320
326	5.46168	900	326	5.46168	900	336	5.82323	297	386	5.98952	321
327	5.46169	498	327	5.46169	498	337	5.82655	296	387	5.99320	322
328	5.46170	905	328	5.46170	905	338	5.82987	295	388	5.99688	323
329	5.46171	493	329	5.46171	493	339	5.83319	294	389	5.99996	324
330	5.46172	900	330	5.46172	900	340	5.83651	293	390	6.00364	325
331	5.46173	498	331	5.46173	498	341	5.83983	292	391	6.00732	326
332	5.46174	905	332	5.46174	905	342	5.84315	291	392	6.01100	327
333	5.46175	493	333	5.46175	493	343	5.84647	290	393	6.01468	328
334	5.46176	900	334	5.46176	900	344	5.84979	289	394	6.01836	329
335	5.46177	498	335	5.46177	498	345	5.85311	288	395	6.02204	330
336	5.46178	905	336	5.46178	905	346	5.85643	287	396	6.02572	331
337	5.46179	493	337	5.46179	493	347	5.85975	286	397	6.02940	332
338	5.46180	900	338	5.46180	900	348	5.86307	285	398	6.03308	333
339	5.46181	498	339	5.46181	498	349	5.86639	284	399	6.03676	334
340	5.46182	905	340	5.46182	905	350	5.86971	283	400	6.04044	335
341	5.46183	493	341	5.46183	493	351	5.87303	282	401	6.04412	336
342	5.46184	900	342	5.46184	900	352	5.87635	281	402	6.04780	337
343	5.46185	498	343	5.46185	498	353	5.87967	280	403	6.05148	338
344	5.46186	905	344	5.46186	905	354	5.88299	279	404	6.05516	339
345	5.46187	493	345	5.46187	493	355	5.88631	278	405	6.05884	340
346	5.46188	900	346	5.46188	900	356	5.88963	277	406	6.06252	341
347	5.46189	498	347	5.46189	498	357	5.89295	276	407	6.06620	342
348	5.46190	905	348	5.46190	905	358	5.89627	275	408	6.06988	343
349	5.46191	493	349	5.46191	493	359	5.89959	274	409	6.07356	344
350	5.46192	900	350	5.46192	900	360	5.90291	273	410	6.07724	345
351	5.46193	498	351	5.46193	498	361	5.90623	272	411	6.08092	346
352	5.46194	905	352	5.46194	905	362	5.90955	271	412	6.08460	347
353	5.46195	493	353	5.46195	493	363	5.91287	270	413	6.08828	348
354	5.46196	900	354	5.46196	900	364	5.91619	269	414	6.09196	349
355	5.46197	498	355	5.46197	498	365	5.91951	268	415	6.09564	350
356	5.46198	905	356	5.46198	905	366	5.92283	267	416	6.09932	351
357	5.46199	493	357	5.46199	493	367	5.92615	266	417	6.10300	352
358	5.46200	900	358	5.46200	900	368	5.92947	265	418	6.10668	353
359	5.46201	498	359	5.46201	498	369	5.93279	264	419	6.11036	354
360	5.46202	905	360	5.46202	905	370	5.93611	263	420	6.11404	355
361	5.46203	493	361	5.46203	493	371	5.93943	262	421	6.11772	356
362	5.46204	900	362	5.46204	900	372	5.94275	261	422	6.12140	357
363	5.46205	498	363	5.46205	498	373	5.94607	260	423	6.12508	358
364	5.46206	905	364	5.46206	905	374	5.94939	259	424	6.12876	359
365	5.46207	493	365	5.46207	493	375	5.95271	258	425	6.13244	360
366	5.46208	900	366	5.46208	900	376	5.95603	257	426	6.13612	361
367	5.46209	498	367	5.46209	498	377	5.95935	256	427	6.13980	362
368	5.46210	905	368	5.46210	905	378	5.96267	255	428	6.14348	363
369	5.46211	493	369	5.46211	493	379	5.96599	254	429	6.14716	364
370	5.46212	900	370	5.46212	900	380	5.96931	253	430	6.15084	365
371	5.46213	498	371	5.46213	498	381	5.97263	252	431	6.15452	366
372	5.46214	905	372	5.46214	905	382	5.97595	251	432	6.15820	367
373	5.46215	493	373	5.46215	493	383	5.97927	250	433	6.16188	368
374	5.46216	900	374	5.46216	900	384	5.98259	249	434	6.16556	369
375	5.46217	498	375	5.46217	498	385	5.98591	248	435	6.16924	370
376	5.46218	905	376	5.46218	905	386	5.98923	247	436	6.17292	371
377	5.46219	493	377	5.46219	493	387	5.99255	246	437	6.17660	372
378	5.46220	900	378	5.46220	900	388	5.99587	245	438	6.18028	373
379	5.46221	498	379	5.46221	498	389	5.99919	244	439	6.18396	374
380	5.46222	905	380	5.46222	905	390	6.00251	243	440	6.18764	375
381	5.46223	493	381	5.46223	493	391	6.00583	242	441	6.19132	376
382	5.46224	900	382	5.46224	900	392	6.00915	241	442	6.19500	377
383	5.46225	498	383	5.46225	498	393	6.01247	240	443	6.19868	378
384	5.46226	905	384	5.46226	905	394	6.01579	239	444	6.20236	379
385	5.46227	493	385	5.46227	493	395	6.01911	238	445	6.20604	380
386	5.46228	900	386	5.46228	900	396	6.02243	237	446	6.20972	381
387	5.46229	498	387	5.46229	498	397	6.02575	236	447	6.21340	382
388	5.46230	905	388	5.46230	905	398	6.02907	235	448	6.21708	383
389	5.46231	493	389	5.46231	493	399	6.03239	234	449	6.22076	384
390	5.46232	900	390	5.46232	900	400	6.03571	233	450	6.22444	385
391	5.46233	498	391	5.46233	498	401	6.03903	232	451	6.22812	386
392	5.46234	905	392	5.46234	905	402	6.04235	231	452	6.23180	387
393	5.46235	493	393	5.46235	493	403	6.04567	230	453	6.23548	388

Natural Logarithms.

u	$\log u$	$u \cdot F'$	u	$\log u$	$u \cdot F'$	u	$\log u$	$u \cdot F'$	u	$\log u$	$u \cdot F'$
400	5.60446	230	490	5.10085	228	500	5.21461	200	530	6.36902	182
401	5.60506	240	451	5.11147	232	501	5.21664	200	551	6.31173	181
402	5.60565	240	452	5.11308	231	502	5.21866	191	552	6.31355	181
403	5.60624	248	453	5.11469	231	503	5.22059	191	553	6.31537	181
404	5.60681	248	454	5.11630	220	504	5.22258	192	554	6.31719	181
405	5.60739	247	455	5.12030	220	505	5.22456	198	555	6.31897	180
406	5.60795	245	456	5.12249	219	506	5.22654	198	556	6.32077	180
407	5.60851	245	457	5.12468	219	507	5.22851	197	557	6.32257	180
408	5.61127	245	458	5.12687	218	508	5.23048	197	558	6.32436	179
409	5.61372	244	459	5.12905	218	509	5.23245	196	559	6.32615	179
410	5.61616	244	460	5.13123	217	510	5.23441	195	560	6.32794	179
411	5.61859	243	461	5.13340	217	511	5.23637	195	561	6.32972	178
412	5.62102	243	462	5.13556	216	512	5.23832	195	562	6.33150	178
413	5.62345	242	463	5.13773	215	513	5.24028	195	563	6.33328	177
414	5.62587	242	464	5.13988	215	514	5.24223	195	564	6.33505	177
415	5.62828	241	465	5.14204	215	515	5.24417	194	565	6.33683	177
416	5.63069	240	466	5.14419	215	516	5.24611	194	566	6.33859	177
417	5.63309	240	467	5.14633	214	517	5.24804	193	567	6.34036	176
418	5.63548	239	468	5.14847	214	518	5.25000	193	568	6.34212	176
419	5.63787	239	469	5.15060	213	519	5.25193	193	569	6.34388	176
420	5.64025	238	470	5.15273	213	520	5.25383	192	570	6.34564	175
421	5.64263	238	471	5.15486	212	521	5.25575	192	571	6.34739	175
422	5.64501	237	472	5.15698	212	522	5.25767	192	572	6.34914	175
423	5.64737	236	473	5.15910	211	523	5.25958	191	573	6.35089	175
424	5.64973	236	474	5.16121	211	524	5.26149	191	574	6.35263	174
425	5.65209	235	475	5.16331	211	525	5.26340	190	575	6.35437	174
426	5.65444	235	476	5.16542	210	526	5.26530	190	576	6.35611	174
427	5.65678	234	477	5.16752	210	527	5.26720	190	577	6.35785	173
428	5.65912	234	478	5.16961	209	528	5.26910	189	578	6.35957	173
429	5.66146	233	479	5.17170	209	529	5.27100	189	579	6.36130	173
430	5.66379	233	480	5.17379	208	530	5.27288	189	580	6.36302	172
431	5.66611	232	481	5.17587	208	531	5.27476	188	581	6.36475	172
432	5.66843	231	482	5.17794	207	532	5.27664	188	582	6.36647	172
433	5.67074	231	483	5.18002	207	533	5.27852	188	583	6.36819	172
434	5.67304	230	484	5.18208	207	534	5.28040	187	584	6.36990	171
435	5.67535	230	485	5.18415	206	535	5.28227	187	585	6.37161	171
436	5.67764	230	486	5.18621	206	536	5.28413	187	586	6.37332	171
437	5.67993	229	487	5.18826	205	537	5.28599	186	587	6.37502	170
438	5.68222	228	488	5.19032	205	538	5.28786	186	588	6.37673	170
439	5.68450	228	489	5.19236	204	539	5.28972	185	589	6.37843	170
440	5.68677	227	490	5.19441	204	540	5.29157	185	590	6.38012	169
441	5.68904	227	491	5.19644	204	541	5.29342	185	591	6.38182	169
442	5.69131	226	492	5.19848	203	542	5.29527	185	592	6.38351	169
443	5.69357	226	493	5.20051	203	543	5.29711	184	593	6.38520	169
444	5.69582	225	494	5.20254	202	544	5.29895	184	594	6.38688	168
445	5.69807	225	495	5.20456	202	545	5.30079	183	595	6.38856	168
446	5.69932	224	496	5.20658	202	546	5.30262	183	596	6.39024	168
447	5.69957	224	497	5.20859	201	547	5.30445	183	597	6.39191	168
448	5.69979	223	498	5.21059	201	548	5.30628	182	598	6.39358	167
449	5.69999	223	499	5.21259	200	549	5.30810	182	599	6.39525	167
450	5.69999	222	500	5.21461	200	550	5.30992	182	600	6.39692	167
e^x	x	e^{-x}	e^x	x	e^{-x}	e^x	x	e^{-x}	e^x	x	e^{-x}

Natural Logarithms.

x	$\log_e x$	$x \cdot E^6$	x	$\log_e x$	$x \cdot E^6$	x	$\log_e x$	$x \cdot E^6$	x	$\log_e x$	$x \cdot E^6$
600	6.39693	167	650	6.47697	154	700	6.55108	143	750	6.62007	133
601	6.39899	166	651	6.47851	154	701	6.55251	143	751	6.62141	133
602	6.40105	166	652	6.48004	153	702	6.55393	142	752	6.62274	133
603	6.40312	166	653	6.48158	153	703	6.55536	142	753	6.62407	133
604	6.40519	166	654	6.48311	153	704	6.55678	142	754	6.62539	133
605	6.40725	165	655	6.48464	153	705	6.55820	142	755	6.62672	132
606	6.40932	165	656	6.48616	152	706	6.55962	142	756	6.62804	132
607	6.41138	165	657	6.48768	152	707	6.56103	141	757	6.62936	132
608	6.41345	164	658	6.48920	152	708	6.56244	141	758	6.63068	132
609	6.41552	164	659	6.49072	152	709	6.56385	141	759	6.63200	132
610	6.41759	164	660	6.49224	152	710	6.56526	141	760	6.63332	132
611	6.41966	164	661	6.49375	151	711	6.56667	141	761	6.63463	131
612	6.42173	163	662	6.49527	151	712	6.56808	140	762	6.63595	131
613	6.42380	163	663	6.49678	151	713	6.56948	140	763	6.63727	131
614	6.42587	163	664	6.49829	151	714	6.57089	140	764	6.63857	131
615	6.42794	163	665	6.49980	150	715	6.57229	140	765	6.63988	131
616	6.43001	162	666	6.50130	150	716	6.57369	140	766	6.64118	131
617	6.43208	162	667	6.50280	150	717	6.57508	139	767	6.64249	130
618	6.43415	162	668	6.50429	150	718	6.57647	139	768	6.64379	130
619	6.43621	162	669	6.50578	149	719	6.57786	139	769	6.64509	130
620	6.43828	161	670	6.50727	149	720	6.57925	139	770	6.64639	130
621	6.44034	161	671	6.50875	149	721	6.58064	139	771	6.64769	130
622	6.44241	161	672	6.51023	148	722	6.58203	139	772	6.64898	130
623	6.44447	161	673	6.51171	148	723	6.58341	138	773	6.65028	129
624	6.44653	160	674	6.51319	148	724	6.58479	138	774	6.65157	129
625	6.44859	160	675	6.51467	148	725	6.58617	138	775	6.65286	129
626	6.45065	160	676	6.51614	148	726	6.58755	138	776	6.65415	129
627	6.45271	159	677	6.51761	147	727	6.58893	138	777	6.65544	129
628	6.45477	159	678	6.51908	147	728	6.59030	137	778	6.65673	129
629	6.45683	159	679	6.52055	147	729	6.59167	137	779	6.65801	128
630	6.45889	159	680	6.52200	147	730	6.59304	137	780	6.65929	128
631	6.46095	158	681	6.52346	147	731	6.59441	137	781	6.66058	128
632	6.46301	158	682	6.52491	147	732	6.59578	137	782	6.66186	128
633	6.46507	158	683	6.52636	146	733	6.59715	136	783	6.66314	128
634	6.46713	158	684	6.52780	146	734	6.59851	136	784	6.66441	128
635	6.46919	157	685	6.52924	146	735	6.59987	136	785	6.66568	127
636	6.47125	157	686	6.53068	146	736	6.60123	136	786	6.66695	127
637	6.47331	157	687	6.53212	145	737	6.60259	136	787	6.66822	127
638	6.47537	157	688	6.53355	145	738	6.60394	135	788	6.66949	127
639	6.47743	156	689	6.53498	145	739	6.60529	135	789	6.67077	127
640	6.47949	156	690	6.53640	145	740	6.60665	135	790	6.67203	127
641	6.48155	156	691	6.53783	145	741	6.60800	135	791	6.67329	126
642	6.48361	156	692	6.53925	145	742	6.60935	135	792	6.67455	126
643	6.48567	156	693	6.54067	144	743	6.61070	135	793	6.67581	126
644	6.48773	155	694	6.54209	144	744	6.61204	134	794	6.67707	126
645	6.48979	155	695	6.54351	144	745	6.61338	134	795	6.67833	126
646	6.49185	155	696	6.54493	144	746	6.61473	134	796	6.67959	126
647	6.49391	155	697	6.54635	143	747	6.61607	134	797	6.68085	125
648	6.49597	154	698	6.54777	143	748	6.61741	134	798	6.68211	125
649	6.49803	154	699	6.54919	143	749	6.61874	134	799	6.68336	125
650	6.49999	154	700	6.55108	143	750	6.62007	133	800	6.68461	125
e^x	x	e^{-x}	e^x	x	e^{-x}	e^x	x	e^{-x}	e^x	x	e^{-x}

Natural Logarithms.

α	$\log. \alpha$	$\alpha - E'$	α	$\log. \alpha$	$\alpha - E'$	α	$\log. \alpha$	$\alpha - E'$	α	$\log. \alpha$	$\alpha - E'$
800	6.68461	125	850	6.72521	118	900	6.80239	111	950	6.88046	105
801	6.68486	125	851	6.72543	118	901	6.80261	111	951	6.88073	105
802	6.68511	125	852	6.72569	117	902	6.80284	111	952	6.88100	105
803	6.68535	125	853	6.72590	117	903	6.80307	111	953	6.88127	105
804	6.68560	124	854	6.72613	117	904	6.80331	111	954	6.88154	105
805	6.68584	124	855	6.72636	117	905	6.80354	110	955	6.88181	105
806	6.68608	124	856	6.72657	117	906	6.80378	110	956	6.88208	105
807	6.68632	124	857	6.72681	117	907	6.80401	110	957	6.88235	105
808	6.68656	124	858	6.72704	117	908	6.80425	110	958	6.88262	104
809	6.68680	124	859	6.72727	116	909	6.80448	110	959	6.88289	104
810	6.68703	123	860	6.72750	116	910	6.80471	110	960	6.88316	104
811	6.68727	123	861	6.72773	116	911	6.80495	110	961	6.88343	104
812	6.68750	123	862	6.72796	116	912	6.80518	110	962	6.88370	104
813	6.68773	123	863	6.72819	116	913	6.80541	110	963	6.88397	104
814	6.68796	123	864	6.72842	116	914	6.80564	109	964	6.88424	104
815	6.68819	123	865	6.72865	116	915	6.80587	109	965	6.88451	103
816	6.68842	123	866	6.72888	115	916	6.80610	109	966	6.88478	103
817	6.68865	122	867	6.72911	115	917	6.80633	109	967	6.88505	103
818	6.68888	122	868	6.72934	115	918	6.80656	109	968	6.88532	103
819	6.68911	122	869	6.72957	115	919	6.80679	109	969	6.88559	103
820	6.68934	122	870	6.72980	115	920	6.80702	109	970	6.88586	103
821	6.68957	122	871	6.73003	115	921	6.80725	109	971	6.88613	103
822	6.68980	122	872	6.73026	115	922	6.80748	108	972	6.88640	103
823	6.69003	122	873	6.73049	115	923	6.80771	108	973	6.88667	103
824	6.69026	121	874	6.73072	114	924	6.80794	108	974	6.88694	103
825	6.69049	121	875	6.73095	114	925	6.80817	108	975	6.88721	103
826	6.69072	121	876	6.73118	114	926	6.80840	108	976	6.88748	103
827	6.69095	121	877	6.73141	114	927	6.80863	108	977	6.88775	102
828	6.69118	121	878	6.73164	114	928	6.80886	108	978	6.88802	102
829	6.69141	121	879	6.73187	114	929	6.80909	108	979	6.88829	102
830	6.69164	120	880	6.73210	114	930	6.80932	108	980	6.88856	102
831	6.69187	120	881	6.73233	114	931	6.80955	107	981	6.88883	102
832	6.69210	120	882	6.73256	113	932	6.80978	107	982	6.88910	102
833	6.69233	120	883	6.73279	113	933	6.81001	107	983	6.88937	102
834	6.69256	120	884	6.73302	113	934	6.81024	107	984	6.88964	102
835	6.69279	120	885	6.73325	113	935	6.81047	107	985	6.88991	102
836	6.69302	120	886	6.73348	113	936	6.81070	107	986	6.89018	101
837	6.69325	119	887	6.73371	113	937	6.81093	107	987	6.89045	101
838	6.69348	119	888	6.73394	113	938	6.81116	107	988	6.89072	101
839	6.69371	119	889	6.73417	112	939	6.81139	106	989	6.89099	101
840	6.69394	119	890	6.73440	112	940	6.81162	106	990	6.89126	101
841	6.69417	119	891	6.73463	112	941	6.81185	106	991	6.89153	101
842	6.69440	119	892	6.73486	112	942	6.81208	106	992	6.89180	101
843	6.69463	119	893	6.73509	112	943	6.81231	106	993	6.89207	101
844	6.69486	118	894	6.73532	112	944	6.81254	106	994	6.89234	101
845	6.69509	118	895	6.73555	112	945	6.81277	106	995	6.89261	101
846	6.69532	118	896	6.73578	112	946	6.81300	106	996	6.89288	101
847	6.69555	118	897	6.73601	111	947	6.81323	106	997	6.89315	100
848	6.69578	118	898	6.73624	111	948	6.81346	105	998	6.89342	100
849	6.69601	118	899	6.73647	111	949	6.81369	105	999	6.89369	100
850	6.69624	118	900	6.80239	111	950	6.89916	105	1000	6.90976	100
a^x	x	a^{-x}	a^x	x	a^{-x}	a^x	x	a^{-x}	a^x	x	a^{-x}

Natural Logarithms.

n	$\text{Log} n$	n	$\text{Log} n$	n	$\text{Log} n$	n	$\text{Log} n$	n	$\text{Log} n$
1000	6.90776	1361	7.21508	1721	7.48066	2111	7.65402	2503	7.82525
1009	6.91072	1370	7.22037	1731	7.48182	2121	7.65586	2511	7.82641
1013	6.91307	1373	7.22475	1733	7.48761	2120	7.66341	2531	7.83007
1019	6.92058	1381	7.23096	1741	7.49321	2131	7.66435	2539	7.83053
1021	6.92854	1390	7.24331	1747	7.49566	2137	7.66710	2543	7.83110
1031	6.93828	1409	7.25064	1753	7.49908	2141	7.66903	2549	7.83436
1033	6.94022	1423	7.26052	1759	7.47290	2143	7.66960	2551	7.83424
1039	6.94604	1427	7.26333	1777	7.48208	2153	7.67164	2557	7.83699
1049	6.95559	1430	7.26473	1783	7.48605	2161	7.67333	2579	7.85516
1051	6.95780	1433	7.26753	1787	7.48829	2170	7.68062	2591	7.85980
1061	6.96607	1436	7.27170	1789	7.48941	2203	7.69758	2593	7.86057
1063	6.96885	1447	7.27745	1801	7.49510	2207	7.69939	2609	7.86672
1069	6.97448	1454	7.28091	1811	7.50163	2213	7.70310	2617	7.86978
1077	6.98118	1453	7.28130	1823	7.50824	2221	7.70571	2621	7.87131
1091	6.99285	1459	7.28551	1831	7.51262	2237	7.71289	2633	7.87988
1093	6.99668	1471	7.29370	1847	7.52132	2239	7.71378	2647	7.88118
1097	7.00033	1481	7.30047	1861	7.52869	2243	7.71557	2657	7.88494
1103	7.00579	1483	7.30182	1867	7.53000	2251	7.71913	2659	7.88571
1109	7.01121	1487	7.30452	1871	7.53123	2257	7.72021	2663	7.88621
1117	7.01840	1489	7.30586	1873	7.53230	2259	7.72090	2671	7.89021
1123	7.02376	1493	7.30864	1877	7.53743	2273	7.72836	2677	7.89345
1129	7.02909	1499	7.31233	1879	7.53850	2281	7.73237	2683	7.89460
1131	7.03189	1511	7.32053	1889	7.54380	2287	7.73390	2687	7.89518
1133	7.03013	1523	7.32854	1901	7.55014	2303	7.73763	2690	7.89690
1163	7.05876	1531	7.33368	1907	7.55320	2307	7.73900	2693	7.89841
1171	7.06561	1543	7.34148	1913	7.55763	2309	7.74457	2699	7.90064
1181	7.07412	1546	7.34539	1931	7.56579	2311	7.74544	2707	7.90360
1187	7.07918	1553	7.34794	1933	7.56783	2333	7.75201	2711	7.90507
1193	7.08423	1559	7.35180	1940	7.57097	2339	7.75748	2713	7.90681
1201	7.09001	1567	7.35698	1951	7.57610	2341	7.75853	2719	7.90809
1213	7.10085	1571	7.35947	1973	7.58731	2347	7.76089	2720	7.91169
1217	7.10414	1570	7.36335	1979	7.59035	2351	7.76360	2731	7.91242
1223	7.10906	1583	7.36708	1987	7.59438	2357	7.76514	2741	7.91608
1229	7.11366	1597	7.37588	1993	7.59740	2371	7.77107	2740	7.91809
1237	7.11958	1601	7.37898	1997	7.59949	2377	7.77359	2753	7.92045
1237	7.12044	1607	7.38312	2009	7.60040	2381	7.77528	2767	7.92552
1249	7.13010	1609	7.38137	2003	7.60240	2383	7.77612	2777	7.92913
1259	7.13807	1613	7.38584	2011	7.60639	2389	7.77803	2789	7.93344
1277	7.15227	1619	7.38995	2017	7.60937	2393	7.78030	2791	7.93446
1279	7.15383	1621	7.39080	2027	7.61431	2399	7.78281	2797	7.93639
1283	7.15696	1627	7.39440	2029	7.61530	2411	7.78780	2801	7.93773
1289	7.16160	1637	7.40002	2039	7.62021	2417	7.79026	2803	7.93845
1301	7.16317	1657	7.41276	2053	7.62706	2423	7.79297	2810	7.94414
1297	7.16781	1663	7.41698	2063	7.63102	2437	7.79832	2833	7.94909
1301	7.17080	1667	7.41876	2069	7.63482	2441	7.80015	2837	7.95059
1303	7.17242	1669	7.41998	2081	7.64060	2447	7.80268	2843	7.95262
1307	7.17540	1693	7.43426	2083	7.64195	2459	7.80751	2851	7.95543
1310	7.18163	1697	7.43662	2087	7.64318	2467	7.81076	2857	7.95753
1321	7.18514	1699	7.43780	2089	7.64444	2473	7.81319	2861	7.95903
1327	7.19068	1709	7.44366	2099	7.64922	2477	7.81480	2879	7.96520
e^x	x	e^x	x	e^x	x	e^x	x	e^x	x

Natural Logarithms.

n	Log n	n	Log n	n	Log n	n	Log n	n	Log n
2887	7.46197	3323	8.10862	3709	8.21858	4095	8.32979	4481	8.44250
2897	7.46143	3330	8.11043	3719	8.22121	4105	8.33076	4497	8.44306
2903	7.47350	3331	8.11051	3727	8.22336	4139	8.33821	4581	8.45011
2909	7.47556	3343	8.11462	3733	8.22497	4153	8.34159	4597	8.45185
2917	7.47831	3347	8.11582	3739	8.22657	4157	8.34255	4597	8.45316
2927	7.48173	3359	8.11940	3761	8.23244	4159	8.34303	4603	8.45416
2939	7.48382	3361	8.11990	3767	8.23403	4177	8.34735	4621	8.45837
2953	7.49098	3371	8.12206	3769	8.23496	4201	8.34368	4637	8.46182
2957	7.49193	3373	8.12296	3779	8.23721	4211	8.34516	4639	8.46225
2963	7.49396	3389	8.12820	3793	8.24091	4217	8.34688	4643	8.46312
2969	7.49598	3391	8.12888	3797	8.24197	4219	8.34735	4649	8.46411
2971	7.49664	3407	8.13339	3803	8.24355	4229	8.34972	4651	8.46481
2999	8.00500	3413	8.13535	3821	8.24827	4231	8.35019	4657	8.46613
3001	8.00676	3433	8.14119	3823	8.24879	4241	8.35255	4661	8.46741
3011	8.01003	3449	8.14584	3833	8.25149	4243	8.35303	4673	8.46956
3019	8.01268	3457	8.14806	3847	8.25305	4253	8.35538	4679	8.47081
3023	8.01300	3461	8.14831	3851	8.25399	4259	8.35679	4681	8.47149
3027	8.01853	3463	8.14889	3853	8.25661	4261	8.35726	4703	8.47596
3041	8.01994	3467	8.15104	3863	8.25920	4271	8.35960	4721	8.47978
3049	8.02257	3469	8.15162	3777	8.26282	4273	8.36007	4723	8.48020
3061	8.02650	3491	8.15794	3881	8.26585	4283	8.36221	4729	8.48147
3067	8.02846	3499	8.16023	3889	8.26691	4289	8.36381	4733	8.48231
3079	8.03236	3511	8.16366	3907	8.27053	4297	8.36567	4751	8.48611
3083	8.03396	3517	8.16536	3911	8.27153	4327	8.37263	4759	8.48799
3089	8.03560	3527	8.16820	3917	8.27308	4337	8.37494	4783	8.49282
3109	8.04206	3589	8.16877	3919	8.27359	4339	8.37540	4787	8.49366
3119	8.04427	3533	8.16990	3923	8.27461	4349	8.37779	4789	8.49426
3121	8.04491	3539	8.17106	3929	8.27614	4357	8.37954	4793	8.49501
3127	8.05102	3541	8.17218	3931	8.27666	4363	8.38002	4799	8.49616
3163	8.05998	3547	8.17386	3943	8.27990	4373	8.38300	4801	8.49658
3167	8.06054	3557	8.17667	3947	8.28091	4391	8.38751	4813	8.49908
3169	8.06117	3559	8.17723	3957	8.28377	4397	8.38868	4817	8.49991
3181	8.06596	3571	8.18060	3989	8.29130	4409	8.39140	4831	8.48381
3187	8.06684	3581	8.18349	4001	8.29470	4421	8.39412	4841	8.48600
3191	8.06809	3583	8.18396	4003	8.29480	4423	8.39457	4871	8.49105
3203	8.07184	3593	8.18674	4007	8.29580	4441	8.39863	4877	8.49220
3209	8.07371	3607	8.19063	4013	8.29729	4447	8.39998	4889	8.49474
3217	8.07600	3613	8.19280	4019	8.29879	4451	8.40088	4903	8.49700
3221	8.07745	3617	8.19300	4021	8.29909	4457	8.40223	4909	8.49883
3229	8.07903	3623	8.19506	4027	8.30098	4463	8.40358	4919	8.50086
3231	8.08072	3631	8.19736	4029	8.30223	4481	8.40760	4931	8.50330
3233	8.08333	3637	8.19891	4051	8.30672	4483	8.40805	4933	8.50379
3237	8.08390	3643	8.20096	4057	8.30800	4493	8.41002	4937	8.50451
3239	8.08318	3659	8.20495	4073	8.31014	4507	8.41330	4943	8.50573
3271	8.09285	3671	8.20822	4079	8.31161	4513	8.41472	4951	8.50731
3299	8.10137	3673	8.20876	4091	8.31654	4517	8.41560	4957	8.50896
3301	8.10168	3677	8.20985	4093	8.31703	4519	8.41605	4967	8.51057
3307	8.10380	3691	8.21366	4099	8.31850	4523	8.41693	4969	8.51097
3313	8.10691	3697	8.21528	4111	8.32142	4527	8.42222	4973	8.51178
3319	8.10742	3701	8.21636	4127	8.32531	4529	8.42266	4987	8.51259
n	x	n	x	n	x	n	x	n	x

Natural Logarithms.

n	Log. n	n	Log. n	n	Log. n	n	Log. n	n	Log. n
4003	8.51570	5437	8.60098	6871	8.67403	8305	8.74624	9739	8.81478
4004	8.51609	5441	8.60172	6875	8.67437	8309	8.74658	9743	8.81537
4005	8.51779	5445	8.60209	6879	8.67530	8313	8.74696	9747	8.81593
4009	8.51869	5449	8.60319	6883	8.67608	8317	8.75005	9751	8.81693
4011	8.51939	5471	8.60722	6887	8.67710	8321	8.75100	9755	8.81758
4021	8.52138	5477	8.60831	6891	8.67744	8325	8.75195	9759	8.81888
4023	8.52178	5479	8.60858	6895	8.67914	8329	8.75200	9763	8.81935
4029	8.52240	5483	8.60941	6899	8.67948	8333	8.75406	9767	8.81965
4051	8.52734	5501	8.61269	6907	8.68220	8341	8.75591	9783	8.82512
4059	8.52869	5503	8.61305	6909	8.68322	8353	8.75668	9823	8.82805
4077	8.53148	5507	8.61378	6923	8.68660	8359	8.75763	9827	8.82864
4081	8.53285	5519	8.61395	6927	8.68727	8361	8.75791	9829	8.82935
4087	8.53444	5521	8.61631	6939	8.68930	8367	8.75888	9833	8.82952
4091	8.53686	5527	8.61740	6953	8.69165	8371	8.75983	9841	8.83060
4101	8.53719	5531	8.61812	6959	8.69534	8379	8.76077	9857	8.83303
4107	8.53837	5557	8.62281	6967	8.69735	8389	8.76233	9865	8.83350
4113	8.53954	5563	8.62380	6969	8.70068	8391	8.76358	9869	8.83477
4119	8.54071	5569	8.62407	6971	8.70135	8421	8.76733	9871	8.83566
4127	8.54617	5573	8.62560	6989	8.70434	8427	8.76836	9883	8.83612
4153	8.54733	5581	8.62712	6997	8.70555	8449	8.77158	9889	8.83768
4169	8.55095	5591	8.62891	6993	8.70665	8451	8.77190	9907	8.84020
4171	8.55083	5593	8.63462	6997	8.70732	8459	8.77478	9911	8.84087
4179	8.55137	5599	8.63746	6993	8.70831	8473	8.77530	9917	8.84174
4189	8.55679	5601	8.63782	6997	8.71062	8481	8.77603	9947	8.84667
4197	8.55834	5607	8.63888	6973	8.71161	8491	8.77817	9949	8.84695
4209	8.55814	5651	8.63950	6979	8.71260	8521	8.78298	9989	8.84779
4227	8.56159	5653	8.63994	6989	8.71424	8529	8.78401	9991	8.84808
4231	8.56265	5657	8.64065	6991	8.71457	8547	8.78576	9997	8.84894
4233	8.56374	5659	8.64100	6101	8.71621	8551	8.78717	9991	8.84951
4237	8.56350	5669	8.64077	6113	8.71817	8553	8.78768	9977	8.85037
4261	8.56808	5681	8.64523	6121	8.71948	8603	8.79000	9983	8.85123
4273	8.57035	5689	8.64639	6131	8.72111	8609	8.79012	9991	8.85238
4279	8.57149	5693	8.64699	6133	8.72144	8621	8.79012	9967	8.85324
4281	8.57187	5701	8.64840	6143	8.72307	8627	8.79133	9991	8.85381
4297	8.57400	5711	8.65015	6151	8.72437	8631	8.79194	9913	8.85552
4303	8.57603	5717	8.65120	6163	8.72632	8699	8.79467	9919	8.85618
4309	8.57716	5737	8.65469	6173	8.72794	8697	8.79588	9927	8.85752
4323	8.57970	5741	8.65530	6197	8.73162	8649	8.79770	9930	8.85822
4333	8.58169	5743	8.65574	6199	8.73214	8657	8.80042	9943	8.85979
4347	8.58439	5749	8.65658	6203	8.73279	8653	8.80089	9957	8.86178
4351	8.58994	5779	8.66199	6211	8.73468	8669	8.80372	9969	8.86347
4381	8.59003	5781	8.66268	6217	8.73594	8671	8.80408	9979	8.86489
4387	8.59174	5791	8.66406	6221	8.73569	8673	8.80582	9983	8.86527
4393	8.59286	5801	8.66579	6229	8.73567	8679	8.80672	9999	8.86612
4399	8.59307	5807	8.66682	6247	8.73985	8689	8.80822	9121	8.87080
4407	8.59545	5811	8.66785	6257	8.74146	8691	8.80852	9127	8.87165
4413	8.59696	5821	8.66923	6263	8.74241	8701	8.81001	9129	8.87193
4417	8.59739	5827	8.67026	6269	8.74337	8703	8.81031	9151	8.87591
4419	8.59757	5839	8.67231	6271	8.74359	8709	8.81121	9159	8.87613
4421	8.59886	5843	8.67300	6277	8.74465	8719	8.81269	9177	8.87651
e ⁿ	x	e ⁿ	x	e ⁿ	x	e ⁿ	x	e ⁿ	x

Natural Logarithms.

N	Log. N	N	Log. N	N	Log. N	N	Log. N	N	Log. N
7187	8.85003	7621	8.87866	8055	8.90675	8489	8.93487	8923	8.96299
7193	8.85086	7629	8.87952	8061	8.90762	8495	8.93574	8929	8.96376
7200	8.85168	7635	8.88035	8111	8.90848	8507	8.93661	8935	8.96458
7211	8.85251	7649	8.88121	8117	8.90934	8509	8.93749	8941	8.96540
7214	8.85334	7650	8.88199	8124	8.91021	8564	8.93836	8949	8.96623
7269	8.88417	7693	8.89156	8127	8.91107	8571	8.93923	8951	8.96705
7279	8.88500	7694	8.89199	8166	8.91192	8577	8.94010	8953	8.96787
7287	8.88583	7699	8.89280	8167	8.91278	8583	8.94098	8959	8.96869
7297	8.88670	7701	8.89361	8173	8.91365	8591	8.94185	8965	8.96951
7312	8.88834	7709	8.89486	8179	8.91451	8597	8.94273	8967	8.97033
7351	8.88917	7753	8.89937	8191	8.91537	8603	8.94360	8971	8.97115
7361	8.89000	7757	8.89978	8200	8.91624	8609	8.94448	8973	8.97197
7367	8.89083	7758	8.89999	8206	8.91711	8617	8.94535	8979	8.97279
7377	8.89166	7767	8.90086	8211	8.91798	8623	8.94623	8985	8.97361
7390	8.89330	7771	8.90168	8214	8.91884	8629	8.94710	8991	8.97443
7421	8.89413	7773	8.90251	8231	8.91970	8635	8.94798	8997	8.97525
7431	8.89496	7775	8.90335	8237	8.92057	8641	8.94885	9003	8.97607
7433	8.89579	7780	8.90376	8243	8.92144	8647	8.94973	9009	8.97689
7439	8.89662	7784	8.90417	8253	8.92231	8653	8.95060	9015	8.97771
7451	8.89826	7793	8.90503	8259	8.92317	8659	8.95148	9021	8.97853
7490	8.89909	7817	8.90686	8273	8.92403	8671	8.95235	9029	8.97935
7493	8.89992	7823	8.90768	8279	8.92490	8677	8.95323	9035	8.98017
7411	8.90075	7831	8.90850	8281	8.92576	8683	8.95410	9041	8.98099
7419	8.90158	7841	8.90932	8284	8.92663	8689	8.95498	9047	8.98181
7451	8.90241	7853	8.91015	8290	8.92750	8695	8.95585	9053	8.98263
7490	8.90324	7897	8.91198	8311	8.92836	8709	8.95672	9059	8.98345
7493	8.90407	7899	8.91280	8317	8.92923	8717	8.95760	9065	8.98427
7411	8.90490	7901	8.91363	8320	8.93010	8723	8.95848	9071	8.98509
7419	8.90573	7909	8.91446	8326	8.93097	8729	8.95935	9077	8.98591
7451	8.90656	7913	8.91529	8331	8.93184	8735	8.96023	9083	8.98673
7457	8.90739	7917	8.91612	8337	8.93271	8741	8.96110	9089	8.98755
7467	8.90822	7919	8.91695	8343	8.93358	8747	8.96198	9095	8.98837
7477	8.90905	7923	8.91778	8349	8.93445	8753	8.96285	9101	8.98919
7487	8.90988	7933	8.91861	8355	8.93532	8759	8.96373	9107	8.98999
7490	8.91071	7935	8.91944	8361	8.93619	8765	8.96460	9113	8.99081
7493	8.91154	7939	8.92027	8367	8.93706	8771	8.96548	9119	8.99163
7411	8.91237	7941	8.92110	8373	8.93793	8777	8.96635	9125	8.99245
7419	8.91320	7943	8.92193	8379	8.93880	8783	8.96723	9131	8.99327
7451	8.91403	7947	8.92276	8385	8.93967	8789	8.96810	9137	8.99409
7457	8.91486	7953	8.92359	8391	8.94054	8795	8.96898	9143	8.99491
7467	8.91569	7957	8.92442	8397	8.94141	8801	8.96985	9149	8.99573
7477	8.91652	7961	8.92525	8403	8.94228	8807	8.97073	9155	8.99655
7487	8.91735	7965	8.92608	8409	8.94315	8813	8.97160	9161	8.99737
7490	8.91818	7969	8.92691	8415	8.94402	8819	8.97248	9167	8.99819
7493	8.91901	7973	8.92774	8421	8.94489	8825	8.97335	9173	8.99901
7411	8.91984	7977	8.92857	8427	8.94576	8831	8.97423	9179	8.99983
7419	8.92067	7981	8.92940	8433	8.94663	8837	8.97510	9185	9.00065
7451	8.92150	7985	8.93023	8439	8.94750	8843	8.97598	9191	9.00147
7457	8.92233	7989	8.93106	8445	8.94837	8849	8.97685	9197	9.00229
7467	8.92316	7993	8.93189	8451	8.94924	8855	8.97773	9203	9.00311
7477	8.92399	7997	8.93272	8457	8.95011	8861	8.97860	9209	9.00393
7487	8.92482	8001	8.93355	8463	8.95098	8867	8.97948	9215	9.00475
7490	8.92565	8005	8.93438	8469	8.95185	8873	8.98035	9221	9.00557
7493	8.92648	8009	8.93521	8475	8.95272	8879	8.98123	9227	9.00639
7411	8.92731	8013	8.93604	8481	8.95359	8885	8.98210	9233	9.00721
7419	8.92814	8017	8.93687	8487	8.95446	8891	8.98298	9239	9.00803
7451	8.92897	8021	8.93770	8493	8.95533	8897	8.98385	9245	9.00885
7457	8.92980	8025	8.93853	8499	8.95620	8903	8.98473	9251	9.00967
7467	8.93063	8029	8.93936	8505	8.95707	8909	8.98560	9257	9.01049
7477	8.93146	8033	8.94019	8511	8.95794	8915	8.98648	9263	9.01131
7487	8.93229	8037	8.94102	8517	8.95881	8921	8.98735	9269	9.01213
7490	8.93312	8041	8.94185	8523	8.95968	8927	8.98823	9275	9.01295
7493	8.93395	8045	8.94268	8529	8.96055	8933	8.98910	9281	9.01377
7411	8.93478	8049	8.94351	8535	8.96142	8939	8.99000	9287	9.01459
7419	8.93561	8053	8.94434	8541	8.96229	8945	8.99087	9293	9.01541
7451	8.93644	8057	8.94517	8547	8.96316	8951	8.99175	9299	9.01623
7457	8.93727	8061	8.94600	8553	8.96403	8957	8.99263	9305	9.01705
7467	8.93810	8065	8.94683	8559	8.96490	8963	8.99350	9311	9.01787
7477	8.93893	8069	8.94766	8565	8.96577	8969	8.99438	9317	9.01869
7487	8.93976	8073	8.94849	8571	8.96664	8975	8.99525	9323	9.01951
7490	8.94059	8077	8.94932	8577	8.96751	8981	8.99613	9329	9.02033
7493	8.94142	8081	8.95015	8583	8.96838	8987	8.99700	9335	9.02115
7411	8.94225	8085	8.95098	8589	8.96925	8993	8.99788	9341	9.02197
7419	8.94308	8089	8.95181	8595	8.97012	8999	8.99875	9347	9.02279
7451	8.94391	8093	8.95264	8601	8.97100	9005	8.99963	9353	9.02361
7457	8.94474	8097	8.95347	8607	8.97187	9011	9.00050	9359	9.02443
7467	8.94557	8101	8.95430	8613	8.97274	9017	9.00138	9365	9.02525
7477	8.94640	8105	8.95513	8619	8.97361	9023	9.00225	9371	9.02607
7487	8.94723	8109	8.95596	8625	8.97448	9029	9.00313	9377	9.02689
7490	8.94806	8113	8.95679	8631	8.97535	9035	9.00400	9383	9.02771
7493	8.94889	8117	8.95762	8637	8.97622	9041	9.00488	9389	9.02853
7411	8.94972	8121	8.95845	8643	8.97709	9047	9.00575	9395	9.02935
7419	8.95055	8125	8.95928	8649	8.97796	9053	9.00663	9401	9.03017
7451	8.95138	8129	8.96011	8655	8.97883	9059	9.00750	9407	9.03099
7457	8.95221	8133	8.96094	8661	8.97970	9065	9.00838	9413	9.03181
7467	8.95304	8137	8.96177	8667	8.98057	9071	9.00925	9419	9.03263
7477	8.95387	8141	8.96260	8673	8.98144	9077	9.01013	9425	9.03345
7487	8.95470	8145	8.96343	8679	8.98231	9083	9.01100	9431	9.03427
7490	8.95553	8149	8.96426	8685	8.98318	9089	9.01188	9437	9.03509
7493	8.95636	8153	8.96509	8691	8.98405	9095	9.01275	9443	9.03591
7411	8.95719	8157	8.96592	8697	8.98492	9101	9.01363	9449	9.03673
7419	8.95802	8161	8.96675	8703	8.98579	9107	9.01450	9455	9.03755
7451	8.95885	8165	8.96758	8709	8.98666	9113	9.01538	9461	9.03837
7457	8.95968	8169	8.96841	8715	8.98753	9119	9.01625	9467	9.03919
7467	8.96051	8173	8.96924	8721	8.98840	9125	9.01713	9473	9.04001
7477	8.96134	8177	8.97007	8727	8.98927	9131	9.01800	9479	9.04083
7487	8.96217	8181	8.97090	8733	8.99014	9137	9.01888	9485	9.04165
7490	8.96300	8185	8.97173	8739	8.99101	9143	9.01975	9491	9.04247
7493	8.96383	8189	8.97256	8745	8.99188	9149	9.02063	9497	9.04329
7411	8.96466	8193	8.97339	8751	8.99275	9155	9.02150	9503	9.04411
7419	8.96549	8197	8.97422	8757	8.99362	9161	9.02238	9509	9.04493
7451	8.96632	8201	8.97505	8763	8.99449	9167	9.02325	9515	9.04575
7457	8.96715	8205	8.97588	8769	8.99536	9173	9.02413	9521	9.04657
7467	8.96798	8209	8.97671	8775	8.99623	9179	9.02500	9527	9.04739
7477	8.96881	8213	8.97754	8781	8.99710	9185	9.02588	9533	9.04821
7487	8.96964	8217	8.97837	8787	8.99797	9191	9.02675	9539	9.04903
7490	8.97047	8221	8.97920	8793	8.99884	9197	9.02763	9545	9.04985
7493	8.97130	8225	8.98003	8799	8.99971	9203	9.02850	9551	9.05067
7411	8.97213	8229	8.98086	8805	9.00058	9209	9.02938	9557	9.05149
7419	8.97296	8233	8.98169	8811	9.00145	9215	9.03025	9563	9.05231
7451	8.97379	8237	8.98252	8817	9.00232	9221	9.03113	9569	9.05313
7457	8.97462	8241							

Natural Logarithms.

n	Log n	n	Log n	n	Log n	n	Log n	n	Log n
0.13	0.11007	0.851	0.16410	0.719	0.18184	0.833	0.18360	0.607	0.20703
0.17	0.15499	0.787	0.18816	0.741	0.18414	0.839	0.18417	0.673	0.20761
0.19	0.16361	0.801	0.16661	0.713	0.18328	0.851	0.18513	0.6000	0.21034
0.21	0.15103	0.713	0.17687	0.739	0.18490	0.857	0.18594	0.60000	11.51293
0.23	0.13514	0.619	0.17159	0.713	0.18330	0.859	0.18614		
0.27	0.15557	0.643	0.17191	0.719	0.18302	0.871	0.18736		
0.27	0.15129	0.619	0.17253	0.707	0.18070	0.881	0.18857		
0.29	0.15851	0.631	0.17294	0.700	0.18007	0.887	0.18868		
0.31	0.15900	0.611	0.17391	0.681	0.18509	0.901	0.19039		
0.37	0.15173	0.619	0.17401	0.707	0.18881	0.907	0.19160		
0.51	0.16020	0.661	0.17585	0.701	0.18022	0.913	0.19261		
0.51	0.16126	0.677	0.17751	0.693	0.18043	0.909	0.19122		
0.53	0.16251	0.699	0.17771	0.681	0.18126	0.911	0.19142		
0.59	0.16314	0.681	0.17875	0.677	0.18189	0.911	0.19142		
0.57	0.16285	0.607	0.17957	0.629	0.18390	0.919	0.19253		
e ⁰	x	e ¹	x	e ²	x	e ³	x	e ⁴	x

Coefficients for Computing,

$$P_{n-1} - P_{n-2} \cos \left[P_{n-2} \pm \frac{n}{2} \alpha_r \right] - \frac{n^2}{6} P_{n-2} \pm \frac{n}{12} (n^2 - 1) \gamma_2 \right].$$

n	$\frac{n^2}{6}$	DIF.	$\frac{n}{12} \left(\frac{n^2-1}{2} \right)$	DIF.	n	$\frac{n^2}{6}$	DIF.	$\frac{n}{12} \left(\frac{n^2-1}{2} \right)$	DIF.
0.01	+0.0000	0	0.0000	8	0.25	+0.0104	9	-0.0202	7
0.01	0.0000	1	0.0000	9	0.26	0.0113	9	0.0209	7
0.01	0.0001	1	0.0017	8	0.27	0.0122	9	0.0217	7
0.03	0.0012	1	0.0025	8	0.28	0.0131	9	0.0224	7
0.04	0.0013	1	0.0033	9	0.29	0.0140	10	0.0232	7
0.05	+0.0003	2	-0.0044	8	0.30	+0.0150	10	-0.0239	7
0.06	0.0005	3	0.0050	8	0.31	0.0160	11	0.0246	7
0.07	0.0008	3	0.0058	8	0.32	0.0171	11	0.0253	7
0.08	0.0011	3	0.0066	9	0.33	0.0182	11	0.0260	7
0.09	0.0013	3	0.0075	8	0.34	0.0193	11	0.0267	7
0.10	+0.0017	3	-0.0083	8	0.35	+0.0204	12	-0.0274	7
0.11	0.0020	4	0.0091	8	0.36	0.0216	12	0.0281	6
0.12	0.0023	4	0.0099	8	0.37	0.0228	13	0.0287	7
0.13	0.0028	4	0.0107	9	0.38	0.0241	13	0.0294	7
0.14	0.0033	5	0.0116	8	0.39	0.0254	13	0.0300	6
0.15	+0.0038	5	-0.0124	8	0.40	+0.0267	13	-0.0307	6
0.16	0.0043	5	0.0132	8	0.41	0.0280	14	0.0313	6
0.17	0.0048	5	0.0140	8	0.42	0.0294	14	0.0319	6
0.18	0.0054	6	0.0148	8	0.43	0.0308	15	0.0325	6
0.19	0.0060	7	0.0155	8	0.44	0.0321	15	0.0331	6
0.20	+0.0067	7	-0.0163	8	0.45	+0.0338	15	-0.0337	6
0.21	0.0073	7	0.0171	8	0.46	0.0353	15	0.0343	5
0.22	0.0081	7	0.0179	8	0.47	0.0368	16	0.0348	5
0.23	0.0088	8	0.0187	8	0.48	0.0381	16	0.0354	5
0.24	0.0096	8	0.0194	8	0.49	0.0400	17	0.0359	5
0.25	+0.0103		-0.0202		0.50	+0.0417		-0.0365	

TABLE VI

THE GUDERMANNIAN

The Gudermannian

n	gd u	wF ₂	gd u	wF ₂	n	gd u	wF ₂	gd u	wF ₂
0.000	0.000 0000	1 0000	0 10 00.000	200.20	0.050	0.050 0000	0.988	5 51 48.00	205.00
.001	.001 0000	1 0000	0 03 26.51	200.20	.051	.051 0000	0.987	5 51 14.05	205.00
.002	.002 0000	1 0000	0 06 53.53	200.20	.052	.052 0000	0.986	5 50 40.01	205.00
.003	.003 0000	1 0000	0 10 18.79	200.20	.053	.053 0000	0.985	5 50 06.00	205.00
.004	.004 0000	1 0000	0 13 45.09	200.20	.054	.054 0000	0.984	5 49 32.00	205.00
0.005	0.005 0000	1 0000	0 17 11.12	200.20	0.055	0.055 0000	0.983	5 48 58.00	205.00
.006	.006 0000	1 0000	0 20 37.38	200.20	.056	.056 0000	0.982	5 48 24.00	205.00
.007	.007 0000	1 0000	0 24 03.61	200.20	.057	.057 0000	0.981	5 47 50.00	205.00
.008	.008 0000	1 0000	0 27 29.10	200.20	.058	.058 0000	0.980	5 47 16.00	205.00
.009	.009 0000	1 0000	0 31 05.30	200.20	.059	.059 0000	0.979	5 46 42.00	205.00
0.010	0.010 0000	0.999	0 34 32.00	200.20	0.100	0.099 0000	0.982	5 46 08.00	205.00
.011	.011 0000	0.999	0 37 48.30	200.20	.061	.060 0000	0.981	5 45 34.00	205.00
.012	.012 0000	0.999	0 41 15.13	200.20	.062	.061 0000	0.980	5 45 00.00	205.00
.013	.013 0000	0.999	0 44 41.37	200.20	.063	.062 0000	0.979	5 44 26.00	205.00
.014	.014 0000	0.999	0 48 07.61	200.20	.064	.063 0000	0.978	5 43 52.00	205.00
0.015	0.015 0000	0.999	0 51 33.85	200.20	0.065	0.064 0000	0.979	5 43 18.00	205.00
.016	.016 0000	0.999	0 55 00.10	200.20	.066	.065 0000	0.978	5 42 44.00	205.00
.017	.017 0000	0.999	0 58 26.33	200.20	.067	.066 0000	0.978	5 42 10.00	205.00
.018	.018 0000	0.998	1 01 52.57	200.20	.068	.067 0000	0.977	5 41 36.00	205.00
.019	.019 0000	0.998	1 05 18.80	200.20	.069	.068 0000	0.976	5 41 02.00	205.00
0.020	0.020 0000	0.998	1 08 45.02	200.20	0.070	0.069 0000	0.976	5 40 28.00	205.00
.021	.021 0000	0.998	1 12 11.21	200.20	.071	.070 0000	0.975	5 40 04.00	205.00
.022	.022 0000	0.998	1 15 37.40	200.20	.072	.071 0000	0.974	5 39 40.00	205.00
.023	.023 0000	0.997	1 19 03.60	200.20	.073	.072 0000	0.973	5 39 16.00	205.00
.024	.024 0000	0.997	1 22 29.81	200.20	.074	.073 0000	0.973	5 38 52.00	205.00
0.025	0.025 0000	0.997	1 25 56.00	200.20	0.075	0.074 0000	0.972	5 38 28.00	205.00
.026	.026 0000	0.997	1 29 22.28	200.20	.076	.075 0000	0.971	5 38 04.00	205.00
.027	.027 0000	0.997	1 32 48.47	200.20	.077	.076 0000	0.970	5 37 40.00	205.00
.028	.028 0000	0.996	1 36 14.66	200.20	.078	.077 0000	0.969	5 37 16.00	205.00
.029	.029 0000	0.996	1 39 40.81	200.20	.079	.078 0000	0.969	5 36 52.00	205.00
0.030	0.030 0000	0.995	1 43 07.02	200.20	0.080	0.079 0000	0.968	5 36 28.00	205.00
.031	.031 0000	0.995	1 46 33.19	200.20	.081	.080 0000	0.967	5 36 04.00	205.00
.032	.032 0000	0.995	1 49 59.35	200.20	.082	.081 0000	0.966	5 35 40.00	205.00

The Gudermannian.

u	gd u	uF ₁ '	gd u	uF ₂ '	u	gd u	uF ₁ '	gd u	uF ₂ '
0.100	0.000 81337	9910	5 43 12.19	205.24	0.150	0.140 4406	9880	8 33 44.35	203.07
0.101	0.001 84877	9910	5 46 37.42	205.22	0.151	0.150 4264	9880	8 37 08.30	203.04
0.102	0.002 88361	9918	5 50 12.62	205.20	0.152	0.151 4181	9880	8 40 31.22	203.01
0.103	0.003 91804	9917	5 53 27.81	205.18	0.153	0.152 4068	9884	8 43 56.11	202.97
0.104	0.004 95209	9916	5 56 52.67	205.15	0.154	0.153 3940	9883	8 47 19.06	202.94
0.105	0.005 98566	9915	6 00 18.12	205.13	0.155	0.154 3811	9881	8 50 43.79	202.91
0.106	0.006 10193	9914	6 03 43.21	205.11	0.156	0.155 3711	9880	8 54 07.59	202.78
0.107	0.007 10611	9913	6 07 08.31	205.09	0.157	0.156 3590	9878	8 57 31.35	202.75
0.108	0.007 2007	9912	6 10 33.42	205.07	0.158	0.157 3467	9876	9 00 55.08	202.72
0.109	0.008 2848	9911	6 13 58.48	205.05	0.159	0.158 3343	9875	9 04 18.78	202.68
0.110	0.009 2788	9910	6 17 23.51	205.02	0.160	0.159 3217	9873	9 07 42.43	202.65
0.111	0.010 2748	9910	6 20 48.52	205.00	0.161	0.160 3089	9872	9 11 06.09	202.62
0.112	0.011 2696	9918	6 24 13.51	204.98	0.162	0.161 2960	9870	9 14 29.69	202.59
0.113	0.012 2643	9919	6 27 38.48	204.95	0.163	0.162 2830	9869	9 17 53.25	202.55
0.114	0.013 2589	9915	6 31 03.42	204.93	0.164	0.163 2697	9867	9 21 16.80	202.52
0.115	0.014 2534	9914	6 34 28.34	204.91	0.165	0.164 2564	9865	9 24 40.31	202.49
0.116	0.015 2479	9913	6 37 53.24	204.88	0.166	0.165 2428	9864	9 28 03.78	202.46
0.117	0.016 2424	9912	6 41 18.11	204.86	0.167	0.166 2291	9862	9 31 27.22	202.42
0.118	0.017 2369	9911	6 44 42.96	204.84	0.168	0.167 2153	9861	9 34 50.62	202.39
0.119	0.018 2314	9910	6 48 07.78	204.81	0.169	0.168 2012	9860	9 38 13.99	202.35
0.120	0.019 2259	9908	6 51 32.59	204.79	0.170	0.169 1870	9857	9 41 37.33	202.32
0.121	0.020 2204	9907	6 54 57.36	204.76	0.171	0.170 1727	9856	9 45 00.63	202.29
0.122	0.021 2149	9906	6 58 22.11	204.74	0.172	0.171 1581	9854	9 48 23.90	202.25
0.123	0.022 2094	9905	7 01 46.81	204.71	0.173	0.172 1434	9853	9 51 47.14	202.22
0.124	0.023 2039	9904	7 05 11.54	204.69	0.174	0.173 1286	9851	9 55 10.33	202.18
0.125	0.024 1984	9902	7 08 36.22	204.66	0.175	0.174 1136	9849	9 58 33.50	202.15
0.126	0.025 1929	9901	7 12 00.87	204.64	0.176	0.175 9843	9847	10 01 56.63	202.11
0.127	0.026 1874	9900	7 15 25.49	204.61	0.177	0.176 8340	9845	10 05 19.72	202.08
0.128	0.027 1819	9900	7 18 50.00	204.59	0.178	0.177 6834	9844	10 08 42.78	202.04
0.129	0.028 1764	9907	7 22 14.67	204.56	0.179	0.178 5317	9842	10 12 05.80	202.00
0.130	0.029 1709	9906	7 25 39.22	204.53	0.180	0.179 4258	9840	10 15 28.78	201.97
0.131	0.030 1654	9915	7 29 03.71	204.51	0.181	0.180 3197	9838	10 18 51.73	201.94
0.132	0.031 1599	9913	7 32 28.23	204.48	0.182	0.181 2135	9837	10 22 14.65	201.90
0.133	0.032 1544	9912	7 35 52.70	204.45	0.183	0.182 1071	9835	10 25 37.52	201.86
0.134	0.033 1489	9911	7 39 17.14	204.43	0.184	0.182 9705	9833	10 29 00.36	201.82
0.135	0.034 1434	9910	7 42 41.55	204.40	0.185	0.183 8637	9831	10 32 23.17	201.78
0.136	0.035 1379	9908	7 46 05.94	204.37	0.186	0.184 7567	9829	10 35 45.93	201.75
0.137	0.036 1324	9907	7 49 30.29	204.34	0.187	0.185 6494	9828	10 39 08.66	201.71
0.138	0.037 1269	9906	7 52 54.62	204.32	0.188	0.186 5422	9826	10 42 31.35	201.67
0.139	0.038 1214	9904	7 56 18.93	204.29	0.189	0.187 4347	9824	10 45 54.01	201.63
0.140	0.039 1159	9903	7 59 43.20	204.26	0.190	0.188 3270	9822	10 49 16.66	201.60
0.141	0.040 1104	9901	8 03 07.45	204.23	0.191	0.189 2192	9820	10 52 39.20	201.56
0.142	0.041 1049	9900	8 06 31.66	204.20	0.192	0.190 1111	9818	10 56 01.74	201.52
0.143	0.042 994	9899	8 09 55.85	204.17	0.193	0.191 8120	9817	10 59 24.24	201.48
0.144	0.043 939	9897	8 13 20.01	204.14	0.194	0.192 7144	9815	11 02 46.71	201.44
0.145	0.044 884	9896	8 16 44.14	204.12	0.195	0.193 7795	9813	11 06 09.13	201.40
0.146	0.045 829	9894	8 20 08.24	204.09	0.196	0.194 7570	9811	11 09 31.51	201.37
0.147	0.046 774	9893	8 23 32.31	204.06	0.197	0.195 7340	9809	11 12 53.86	201.33
0.148	0.047 719	9891	8 26 56.35	204.03	0.198	0.196 7188	9807	11 16 16.17	201.30
0.149	0.048 664	9890	8 30 20.36	204.00	0.199	0.197 6991	9805	11 19 38.43	201.25
0.150	0.049 609	9889	8 33 44.35	203.97	0.200	0.198 6798	9803	11 23 00.66	201.21
u	$2 \tan^{-1}(e^u) - \frac{\pi}{2}$	u each u	$2 \tan^{-1}(e^u) - 90^\circ$	u each u	u	$2 \tan^{-1}(e^u) - \frac{\pi}{2}$	u each u	$2 \tan^{-1}(e^u) - 90^\circ$	u each u

The Gudermannian.

u	$\operatorname{gd} u$	$\operatorname{sech} u$	$\operatorname{gd} u$	$\operatorname{sech} u$	u	$\operatorname{gd} u$	$\operatorname{sech} u$	$\operatorname{gd} u$	$\operatorname{sech} u$
0.200	0.198 6798	9803	11 25 00.66	202.21	0.230	0.217 4358	9505	14 10 37.30	190.48
.201	.199 6661	9801	11 26 22.85	202.17	.231	.218 4252	9503	14 13 57.26	190.03
.202	.200 6491	9799	11 27 44.99	202.13	.232	.219 4144	9501	14 17 17.16	189.58
.203	.201 6290	9797	11 33 07.10	202.09	.233	.220 4034	9498	14 20 37.02	189.14
.204	.202 5996	9795	11 36 29.17	202.05	.234	.221 3921	9496	14 23 56.83	188.70
0.205	0.203 5700	9794	11 39 51.19	202.01	0.235	0.222 3805	9493	14 27 16.59	188.27
.206	.204 5383	9792	11 43 13.18	201.96	.236	.223 3688	9491	14 30 36.31	187.83
.207	.205 5104	9790	11 46 35.12	201.92	.237	.224 3567	9489	14 33 55.97	187.40
.208	.206 4816	9788	11 49 57.02	201.88	.238	.225 3445	9486	14 37 15.58	186.96
.209	.207 4500	9786	11 53 18.89	201.84	.239	.226 3320	9484	14 40 35.14	186.53
0.210	0.208 4233	9785	11 56 40.71	201.80	0.240	0.227 3192	9481	14 43 54.66	186.10
.211	.209 4315	9784	12 00 02.48	201.76	.241	.228 3062	9479	14 47 14.10	185.67
.212	.210 4296	9782	12 03 24.22	201.71	.242	.229 2930	9476	14 50 33.51	185.24
.213	.211 4274	9777	12 06 45.01	201.67	.243	.230 2796	9474	14 53 52.87	184.81
.214	.212 3851	9775	12 10 07.96	201.63	.244	.231 2661	9471	14 57 12.18	184.39
0.215	0.213 3625	9773	12 13 30.17	201.59	0.245	0.231 2518	9469	15 00 31.43	183.96
.216	.214 3307	9771	12 16 50.74	201.54	.246	.232 2373	9467	15 03 50.63	183.53
.217	.215 3167	9769	12 20 12.26	201.50	.247	.233 2226	9464	15 07 09.78	183.10
.218	.216 2935	9767	12 23 33.74	201.46	.248	.234 2078	9461	15 10 28.88	182.68
.219	.217 2701	9765	12 26 55.38	201.42	.249	.235 1928	9459	15 13 47.93	182.25
0.220	0.218 2465	9763	12 30 16.37	201.37	0.270	0.236 1781	9446	15 17 06.92	181.82
.221	.219 2227	9761	12 33 37.02	201.33	.271	.237 1632	9444	15 20 25.85	181.39
.222	.220 1986	9759	12 36 58.23	201.28	.272	.238 1481	9441	15 23 44.75	180.96
.223	.221 1744	9756	12 40 20.49	201.24	.273	.239 1328	9439	15 27 03.59	180.53
.224	.222 1499	9754	12 43 41.71	201.20	.274	.240 1173	9436	15 30 22.37	180.10
0.225	0.223 1252	9752	12 47 02.88	201.15	0.275	0.241 1018	9433	15 33 41.10	179.67
.226	.224 1003	9750	12 50 24.01	201.11	.276	.242 8612	9431	15 36 59.78	179.24
.227	.225 7534	9748	12 53 45.10	201.06	.277	.243 7024	9428	15 40 18.41	178.81
.228	.226 5099	9746	12 57 06.14	201.02	.278	.244 5434	9426	15 43 36.98	178.38
.229	.227 2643	9743	13 00 27.13	200.97	.279	.245 3843	9423	15 46 55.49	177.95
0.230	0.227 9986	9741	13 03 48.08	200.93	0.280	0.246 3244	9420	15 50 13.95	177.52
.231	.228 7276	9739	13 07 08.99	200.88	.281	.247 2644	9418	15 53 32.36	177.09
.232	.229 4551	9737	13 10 29.85	200.84	.282	.248 2042	9415	15 56 50.72	176.66
.233	.230 1999	9735	13 13 50.66	200.79	.283	.249 1439	9413	15 59 09.02	176.23
.234	.231 8933	9732	13 17 11.42	200.74	.284	.250 8353	9410	16 02 27.26	175.80
0.235	0.232 8664	9730	13 20 32.15	200.70	0.285	0.251 7184	9407	16 05 45.45	175.37
.236	.233 8363	9728	13 23 52.82	200.65	.286	.252 6012	9404	16 09 03.58	174.94
.237	.234 8140	9726	13 27 13.45	200.60	.287	.253 4838	9402	16 12 21.66	174.51
.238	.235 7844	9724	13 30 34.03	200.56	.288	.254 3661	9400	16 15 39.69	174.08
.239	.236 7566	9721	13 33 54.56	200.51	.289	.255 2481	9397	16 19 57.66	173.65
0.240	0.237 7286	9719	13 37 15.05	200.46	0.290	0.256 1296	9394	16 23 15.57	173.22
.241	.238 7004	9717	13 40 35.40	200.42	.291	.257 9778	9391	16 26 33.43	172.79
.242	.239 6719	9714	13 43 55.88	200.37	.292	.258 8268	9388	16 30 51.23	172.36
.243	.240 6432	9712	13 47 16.23	200.33	.293	.259 6755	9386	16 34 08.97	171.93
.244	.241 6143	9710	13 50 36.53	200.27	.294	.260 5239	9383	16 37 26.66	171.50
0.245	0.242 5851	9707	13 53 56.77	200.23	0.295	0.260 3719	9380	16 40 44.30	171.07
.246	.243 5557	9705	13 57 16.98	200.18	.296	.261 2199	9377	16 43 01.87	170.64
.247	.244 5261	9703	14 00 37.13	200.13	.297	.262 1675	9375	16 46 19.39	170.21
.248	.245 4969	9700	14 03 57.23	200.08	.298	.263 1149	9372	16 49 36.85	169.78
.249	.246 4661	9698	14 07 17.29	200.03	.299	.264 6419	9369	16 52 54.26	169.35
0.250	0.247 4358	9695	14 10 37.30	199.98	0.300	0.265 5987	9366	16 56 11.60	168.92
u	$2 \tan^{-1}(e^u) - \frac{\pi}{2}$	$\operatorname{sech} u$	$2 \tan^{-1}(e^u) - 90^\circ$	$\operatorname{sech} u$	u	$2 \tan^{-1}(e^u) - \frac{\pi}{2}$	$\operatorname{sech} u$	$2 \tan^{-1}(e^u) - 90^\circ$	$\operatorname{sech} u$

SMITHSONIAN TABLES

The Gudermannian.

u	$\operatorname{gd} u$	$\operatorname{sech} u$	$\operatorname{gd} u$	$\operatorname{sech} u$	u	$\operatorname{gd} u$	$\operatorname{sech} u$	$\operatorname{gd} u$	$\operatorname{sech} u$
0.300	0.305 5987	0.950	16 31 11.00	0.9732	0.350	0.343 0655	0.917	19 30 22.34	0.84.25
0.301	0.306 5852	0.949	16 30 28.89	0.9730	0.351	0.344 0071	0.915	19 42 26.55	0.84.18
0.302	0.307 5714	0.948	17 02 26.13	0.9729	0.352	0.344 9483	0.911	19 45 59.70	0.84.11
0.303	0.308 5573	0.947	17 03 03.30	0.9727	0.353	0.345 8893	0.908	19 49 04.78	0.84.05
0.304	0.309 5429	0.945	17 09 23.42	0.9709	0.354	0.346 8299	0.905	19 52 18.80	0.83.98
0.305	0.309 5281	0.944	17 12 27.48	0.9703	0.355	0.347 7702	0.901	19 55 32.75	0.83.92
0.306	0.309 5131	0.943	17 15 51.48	0.9697	0.356	0.348 7101	0.898	19 58 46.63	0.83.85
0.307	0.309 4982	0.942	17 19 11.42	0.9691	0.357	0.349 6498	0.895	20 02 00.45	0.83.78
0.308	0.309 4831	0.941	17 22 28.30	0.9685	0.358	0.350 5891	0.892	20 05 14.20	0.83.72
0.309	0.309 4680	0.940	17 25 45.12	0.9679	0.359	0.351 5281	0.888	20 08 27.88	0.83.65
0.310	0.309 4529	0.938	17 29 01.89	0.9674	0.360	0.352 4668	0.885	20 11 41.80	0.83.58
0.311	0.309 4378	0.937	17 32 18.60	0.9668	0.361	0.353 4052	0.882	20 14 55.05	0.83.52
0.312	0.309 4226	0.936	17 35 35.24	0.9662	0.362	0.354 3432	0.878	20 18 08.54	0.83.45
0.313	0.309 4074	0.935	17 38 51.83	0.9656	0.363	0.355 2809	0.875	20 21 21.95	0.83.38
0.314	0.309 3921	0.934	17 42 08.36	0.9650	0.364	0.356 2183	0.872	20 24 35.30	0.83.32
0.315	0.309 3768	0.932	17 45 24.83	0.9644	0.365	0.357 1554	0.869	20 27 48.59	0.83.25
0.316	0.309 3615	0.931	17 48 41.24	0.9638	0.366	0.358 0921	0.866	20 31 01.80	0.83.18
0.317	0.311 3461	0.930	17 51 57.58	0.9632	0.367	0.359 0285	0.862	20 34 14.95	0.83.11
0.318	0.312 3307	0.929	17 55 13.87	0.9626	0.368	0.359 9641	0.859	20 37 28.05	0.83.05
0.319	0.313 3153	0.928	17 58 30.10	0.9620	0.369	0.360 8991	0.856	20 40 41.04	0.82.98
0.320	0.314 2999	0.926	18 01 46.26	0.9614	0.370	0.361 8338	0.852	20 43 53.98	0.82.91
0.321	0.315 2845	0.925	18 05 02.37	0.9608	0.371	0.362 7778	0.849	20 47 06.80	0.82.84
0.322	0.316 2692	0.924	18 08 18.42	0.9602	0.372	0.363 7209	0.846	20 50 19.66	0.82.77
0.323	0.317 2538	0.923	18 11 34.40	0.9596	0.373	0.364 6630	0.843	20 53 32.45	0.82.70
0.324	0.318 2385	0.922	18 14 50.32	0.9590	0.374	0.365 6041	0.840	20 56 45.07	0.82.63
0.325	0.319 2232	0.921	18 18 06.19	0.9584	0.375	0.366 5448	0.836	20 59 57.67	0.82.57
0.326	0.320 2079	0.920	18 21 21.99	0.9577	0.376	0.367 4841	0.832	21 03 10.20	0.82.50
0.327	0.321 1925	0.919	18 24 37.72	0.9571	0.377	0.368 4223	0.829	21 06 22.66	0.82.43
0.328	0.322 1771	0.918	18 27 53.40	0.9565	0.378	0.369 3591	0.826	21 09 35.05	0.82.36
0.329	0.323 1618	0.917	18 31 09.02	0.9558	0.379	0.370 2955	0.822	21 12 47.38	0.82.29
0.330	0.324 1464	0.916	18 34 24.57	0.9552	0.380	0.371 2316	0.819	21 15 59.63	0.82.22
0.331	0.325 1311	0.915	18 37 40.06	0.9546	0.381	0.372 1673	0.816	21 19 11.82	0.82.15
0.332	0.326 1158	0.914	18 40 55.49	0.9540	0.382	0.373 1027	0.812	21 22 23.93	0.82.08
0.333	0.327 1005	0.913	18 44 10.85	0.9533	0.383	0.374 0378	0.809	21 25 35.97	0.82.01
0.334	0.327 9528	0.912	18 47 26.16	0.9527	0.384	0.374 9725	0.805	21 28 47.05	0.81.94
0.335	0.328 8944	0.911	18 50 41.40	0.9521	0.385	0.375 9068	0.802	21 31 58.18	0.81.87
0.336	0.329 8360	0.910	18 53 56.57	0.9515	0.386	0.376 8406	0.800	21 35 09.20	0.81.80
0.337	0.330 7775	0.909	18 57 11.69	0.9508	0.387	0.377 7740	0.797	21 38 20.15	0.81.73
0.338	0.331 7190	0.908	19 00 26.74	0.9502	0.388	0.378 7069	0.794	21 41 31.11	0.81.66
0.339	0.332 6605	0.907	19 03 41.72	0.9495	0.389	0.379 6393	0.791	21 44 42.06	0.81.59
0.340	0.333 6019	0.906	19 06 56.65	0.9489	0.390	0.380 5713	0.788	21 47 52.91	0.81.51
0.341	0.334 5432	0.905	19 10 11.50	0.9483	0.391	0.381 5029	0.785	21 51 03.70	0.81.44
0.342	0.335 4845	0.904	19 13 26.30	0.9476	0.392	0.382 4340	0.782	21 54 14.40	0.81.37
0.343	0.336 4257	0.903	19 16 41.03	0.9470	0.393	0.383 3647	0.779	21 57 25.11	0.81.30
0.344	0.337 3668	0.902	19 19 55.70	0.9463	0.394	0.384 2951	0.777	22 00 35.80	0.81.23
0.345	0.338 3079	0.901	19 23 10.30	0.9457	0.395	0.385 2251	0.774	22 03 54.00	0.81.16
0.346	0.339 2489	0.900	19 26 24.84	0.9451	0.396	0.386 1548	0.771	22 07 06.11	0.81.09
0.347	0.340 1899	0.899	19 29 39.31	0.9444	0.397	0.387 0841	0.769	22 10 17.16	0.81.01
0.348	0.341 1308	0.898	19 32 53.72	0.9438	0.398	0.388 0130	0.767	22 13 28.14	0.80.94
0.349	0.342 1216	0.897	19 36 08.06	0.9431	0.399	0.389 9415	0.764	22 16 39.04	0.80.87
0.350	0.343 0625	0.896	19 39 22.34	0.9425	0.400	0.390 8691	0.762	22 19 49.88	0.80.80
u	$2 \operatorname{tanh}^{-1}(\operatorname{sech} u)$	$\operatorname{sech} u$	$2 \operatorname{tanh}^{-1}(\operatorname{sech} u)$	$\operatorname{sech} u$	u	$2 \operatorname{tanh}^{-1}(\operatorname{sech} u)$	$\operatorname{sech} u$	$2 \operatorname{tanh}^{-1}(\operatorname{sech} u)$	$\operatorname{sech} u$

The Gudermannian.

n	gd n	=F ₂	gd u	=F ₂	u	gd u	=F ₂	gd n	=F ₂
0.400	0.389 7411	9299	22 19 49.88	100.80	0.450	0.439 5388	9906	24 57 16.41	107.10
0.401	0.390 6660	9307	22 23 10.64	100.72	0.451	0.440 4154	9913	25 00 41.41	107.01
0.402	0.391 5904	9315	22 26 11.44	100.65	0.452	0.441 3514	9921	25 03 16.58	106.93
0.403	0.392 5149	9323	22 29 21.91	100.58	0.453	0.442 2571	9928	25 05 47.04	106.85
0.404	0.393 4393	9330	22 32 32.48	100.51	0.454	0.443 1824	9935	25 08 13.74	106.77
0.405	0.394 3638	9338	22 35 43.05	100.43	0.455	0.444 1075	9942	25 10 40.39	106.69
0.406	0.395 2884	9345	22 38 53.35	100.36	0.456	0.445 0278	9949	25 13 06.68	106.61
0.407	0.396 2130	9353	22 42 03.67	100.29	0.457	0.446 0079	9956	25 15 31.46	106.53
0.408	0.397 1376	9360	22 45 13.92	100.21	0.458	0.447 0000	9963	25 17 56.24	106.45
0.409	0.398 0621	9368	22 48 24.09	100.14	0.459	0.448 0000	9970	25 20 10.39	106.37
0.410	0.398 9865	9375	22 51 34.19	100.06	0.460	0.449 0000	9977	25 22 34.46	106.29
0.411	0.399 9108	9383	22 54 44.32	100.00	0.461	0.450 0000	9984	25 25 00.00	106.21
0.412	0.400 8352	9390	22 57 54.48	100.02	0.462	0.451 0000	9991	25 27 25.00	106.13
0.413	0.401 7595	9398	23 01 04.65	100.01	0.463	0.452 0000	9998	25 29 50.00	106.05
0.414	0.402 6838	9405	23 04 14.86	100.00	0.464	0.453 0000	10000	25 32 15.00	105.97
0.415	0.403 6081	9413	23 07 25.09	100.00	0.465	0.454 0000	10000	25 34 40.00	105.89
0.416	0.404 5324	9420	23 10 35.35	100.02	0.466	0.455 0000	10000	25 37 05.00	105.81
0.417	0.405 4567	9428	23 13 45.61	100.04	0.467	0.456 0000	10000	25 39 30.00	105.73
0.418	0.406 3810	9435	23 16 55.88	100.07	0.468	0.457 0000	10000	25 41 55.00	105.65
0.419	0.407 3053	9443	23 20 06.17	100.10	0.469	0.458 0000	10000	25 44 20.00	105.57
0.420	0.408 2296	9450	23 23 16.48	100.13	0.470	0.459 0000	10000	25 46 45.00	105.49
0.421	0.409 1539	9458	23 26 26.81	100.16	0.471	0.460 0000	10000	25 49 10.00	105.41
0.422	0.410 0782	9465	23 29 37.16	100.19	0.472	0.461 0000	10000	25 51 35.00	105.33
0.423	0.411 0025	9473	23 32 47.53	100.22	0.473	0.462 0000	10000	25 54 00.00	105.25
0.424	0.411 9268	9480	23 35 57.91	100.25	0.474	0.463 0000	10000	25 56 25.00	105.17
0.425	0.412 8511	9488	23 39 08.30	100.28	0.475	0.464 0000	10000	25 58 50.00	105.09
0.426	0.413 7754	9495	23 42 18.71	100.31	0.476	0.465 0000	10000	26 01 15.00	105.01
0.427	0.414 6997	9503	23 45 29.14	100.34	0.477	0.466 0000	10000	26 03 40.00	104.93
0.428	0.415 6240	9510	23 48 39.59	100.37	0.478	0.467 0000	10000	26 06 05.00	104.85
0.429	0.416 5483	9518	23 51 50.06	100.40	0.479	0.468 0000	10000	26 08 30.00	104.77
0.430	0.417 4726	9525	23 55 00.55	100.43	0.480	0.469 0000	10000	26 10 55.00	104.69
0.431	0.418 3969	9533	23 58 11.06	100.46	0.481	0.470 0000	10000	26 13 20.00	104.61
0.432	0.419 3212	9540	24 01 21.59	100.49	0.482	0.471 0000	10000	26 15 45.00	104.53
0.433	0.420 2455	9548	24 04 32.14	100.52	0.483	0.472 0000	10000	26 18 10.00	104.45
0.434	0.421 1698	9555	24 07 42.71	100.55	0.484	0.473 0000	10000	26 20 35.00	104.37
0.435	0.422 0941	9563	24 10 53.30	100.58	0.485	0.474 0000	10000	26 23 00.00	104.29
0.436	0.423 0184	9570	24 14 03.91	100.61	0.486	0.475 0000	10000	26 25 25.00	104.21
0.437	0.423 9427	9578	24 17 14.54	100.64	0.487	0.476 0000	10000	26 27 50.00	104.13
0.438	0.424 8670	9585	24 20 25.19	100.67	0.488	0.477 0000	10000	26 30 15.00	104.05
0.439	0.425 7913	9593	24 23 35.86	100.70	0.489	0.478 0000	10000	26 32 40.00	103.97
0.440	0.426 7156	9600	24 26 46.55	100.73	0.490	0.479 0000	10000	26 35 05.00	103.89
0.441	0.427 6399	9608	24 29 57.26	100.76	0.491	0.480 0000	10000	26 37 30.00	103.81
0.442	0.428 5642	9615	24 33 07.99	100.79	0.492	0.481 0000	10000	26 39 55.00	103.73
0.443	0.429 4885	9623	24 36 18.74	100.82	0.493	0.482 0000	10000	26 42 20.00	103.65
0.444	0.430 4128	9630	24 39 29.51	100.85	0.494	0.483 0000	10000	26 44 45.00	103.57
0.445	0.431 3371	9638	24 42 40.30	100.88	0.495	0.484 0000	10000	26 47 10.00	103.49
0.446	0.432 2614	9645	24 45 51.11	100.91	0.496	0.485 0000	10000	26 49 35.00	103.41
0.447	0.433 1857	9653	24 49 01.94	100.94	0.497	0.486 0000	10000	26 51 60.00	103.33
0.448	0.434 1100	9660	24 52 12.79	100.97	0.498	0.487 0000	10000	26 53 15.00	103.25
0.449	0.435 0343	9668	24 55 23.56	101.00	0.499	0.488 0000	10000	26 55 40.00	103.17
0.450	0.435 9586	9675	24 58 34.35	101.03	0.500	0.489 0000	10000	26 58 05.00	103.09
0.451	0.436 8829	9683	25 01 45.16	101.06	0.501	0.490 0000	10000	26 60 30.00	103.01
0.452	0.437 8072	9690	25 04 55.99	101.09	0.502	0.491 0000	10000	26 62 55.00	102.93
0.453	0.438 7315	9698	25 08 06.84	101.12	0.503	0.492 0000	10000	26 65 20.00	102.85
0.454	0.439 6558	9705	25 11 17.61	101.15	0.504	0.493 0000	10000	26 67 45.00	102.77
0.455	0.440 5801	9713	25 14 28.40	101.18	0.505	0.494 0000	10000	26 70 10.00	102.69
0.456	0.441 5044	9720	25 17 39.21	101.21	0.506	0.495 0000	10000	26 72 35.00	102.61
0.457	0.442 4287	9728	25 20 50.04	101.24	0.507	0.496 0000	10000	26 75 00.00	102.53
0.458	0.443 3530	9735	25 24 00.89	101.27	0.508	0.497 0000	10000	26 77 25.00	102.45
0.459	0.444 2773	9743	25 27 11.76	101.30	0.509	0.498 0000	10000	26 79 50.00	102.37
0.460	0.445 2016	9750	25 30 22.65	101.33	0.510	0.499 0000	10000	26 82 15.00	102.29
0.461	0.446 1259	9758	25 33 33.56	101.36	0.511	0.500 0000	10000	26 84 40.00	102.21
0.462	0.447 0502	9765	25 36 44.49	101.39	0.512	0.501 0000	10000	26 87 05.00	102.13
0.463	0.447 9745	9773	25 39 55.44	101.42	0.513	0.502 0000	10000	26 89 30.00	102.05
0.464	0.448 8988	9780	25 43 06.41	101.45	0.514	0.503 0000	10000	26 91 55.00	101.97
0.465	0.449 8231	9788	25 46 17.40	101.48	0.515	0.504 0000	10000	26 94 20.00	101.89
0.466	0.450 7474	9795	25 49 28.41	101.51	0.516	0.505 0000	10000	26 96 45.00	101.81
0.467	0.451 6717	9803	25 52 39.44	101.54	0.517	0.506 0000	10000	26 99 10.00	101.73
0.468	0.452 5960	9810	25 55 50.49	101.57	0.518	0.507 0000	10000	27 01 35.00	101.65
0.469	0.453 5203	9818	25 59 01.56	101.60	0.519	0.508 0000	10000	27 04 00.00	101.57
0.470	0.454 4446	9825	26 02 12.65	101.63	0.520	0.509 0000	10000	27 06 25.00	101.49
0.471	0.455 3689	9833	26 05 23.76	101.66	0.521	0.510 0000	10000	27 08 50.00	101.41
0.472	0.456 2932	9840	26 08 34.89	101.69	0.522	0.511 0000	10000	27 11 15.00	101.33
0.473	0.457 2175	9848	26 11 46.04	101.72	0.523	0.512 0000	10000	27 13 40.00	101.25
0.474	0.458 1418	9855	26 14 57.21	101.75	0.524	0.513 0000	10000	27 16 05.00	101.17
0.475	0.459 0661	9863	26 18 08.40	101.78	0.525	0.514 0000	10000	27 18 30.00	101.09
0.476	0.460 0000	9870	26 21 19.61	101.81	0.526	0.515 0000	10000	27 20 55.00	101.01
0.477	0.460 9339	9878	26 24 30.84	101.84	0.527	0.516 0000	10000	27 23 20.00	100.93
0.478	0.461 8678	9885	26 27 42.09	101.87	0.528	0.517 0000	10000	27 25 45.00	100.85
0.479	0.462 8017	9893	26 30 53.36	101.90	0.529	0.518 0000	10000	27 28 10.00	100.77
0.480	0.463 7356	9900	26 34 04.65	101.93	0.530	0.519 0000	10000	27 30 35.00	100.69
0.481	0.464 6695	9908	26 37 15.96	101.96	0.531	0.520 0000	10000	27 33 00.00	100.61
0.482	0.465 6034	9915	26 40 27.29	101.99	0.532	0.521 0000	10000	27 35 25.00	100.53
0.483	0.466 5373	9923	26 43 38.64	102.02	0.533	0.522 0000	10000	27 37 50.00	100.45
0.484	0.467 4712	9930	26 46 49.99	102.05	0.534	0.523 0000	10000	27 40 15.00	100.37
0.485	0.468 4051	9938	26 49 61.36	102.08	0.535	0.524 0000	10000	27 42 40.00	100.29
0.486	0.469 3390	9945	26 52 72.75	102.11	0.536	0.525 0000	10000	27 45 05.00	100.21
0.487	0.470 2729	9953	26 55 84.16	102.14	0.537	0.526 0000	10000	27 47 30.00	100.13
0.488	0.471 2068	9960	26 58 95.59	102.17	0.538	0.527 0000	10000	27 49 55.00	100.05
0.489	0.472 1407	9968	27 01 07.04	102.20	0.539	0.528 0000	10000	27 52 20.00	99.97
0.490	0.473 0746	9975	27 04 18.51	102.23	0.540	0.529 0000	10000	27 54 45.00	99.89
0.491	0.474 0085	9983	27 07 30.00	102.26	0.541	0.530 0000	10000	27 57 10.00	99.81
0.492	0.474 9424	9990	27 10 41.51	102.29	0.542	0.531 0000	10000	27 59 35.00	99.73
0.493	0.475 8763	9998	27 13 53.04	102.32	0.543	0.532 0000	10000	28 01 60.00	99.65
0.494	0.476 8102	10000	27 17 04.59	102.35	0.544	0.533 0000	10000	28 03 15.00	

The Undermannian.

α	\sin	\cos	\tan	\cot	\sec	\csc	α	\sin	\cos	\tan	\cot	\sec	\csc
0.500	0.480	0.811	8888	27.31	45.71	182.19	0.550	0.524	1096	8657	30.02	03.02	178.57
.501	.481	.807	8891	27.34	45.80	182.13	.551	.525	1095	8653	30.05	03.05	178.48
.502	.482	.803	8894	27.37	45.88	182.15	.552	.525	1094	8649	30.08	03.08	178.39
.503	.483	.800	8897	27.40	45.96	182.16	.553	.526	1093	8645	30.10	03.10	178.30
.504	.484	.797	8900	27.43	46.04	182.18	.554	.527	1092	8640	30.13	03.13	178.21
0.505	0.485	.794	8903	27.46	46.12	182.20	0.555	0.528	1091	8636	30.16	03.16	178.12
.506	.485	.791	8906	27.49	46.20	182.21	.556	.529	1090	8632	30.19	03.19	178.03
.507	.486	.788	8909	27.52	46.28	182.23	.557	.530	1089	8627	30.22	03.22	177.94
.508	.487	.785	8912	27.55	46.36	182.24	.558	.531	1088	8623	30.25	03.25	177.85
.509	.488	.782	8915	27.58	46.44	182.25	.559	.532	1087	8618	30.28	03.28	177.76
0.510	0.489	.779	8918	28.01	46.52	182.27	0.560	0.533	1086	8614	30.31	03.31	177.67
.511	.490	.776	8921	28.04	46.60	182.28	.561	.533	1085	8610	30.34	03.34	177.58
.512	.491	.773	8924	28.07	46.68	182.30	.562	.534	1084	8605	30.37	03.37	177.49
.513	.492	.770	8927	28.10	46.76	182.31	.563	.535	1083	8601	30.40	03.40	177.40
.514	.493	.767	8930	28.13	46.84	182.33	.564	.536	1082	8596	30.43	03.43	177.31
0.515	0.494	.764	8933	28.16	46.92	182.34	0.565	0.537	1081	8592	30.46	03.46	177.22
.516	.495	.761	8936	28.19	47.00	182.35	.566	.537	1080	8587	30.49	03.49	177.13
.517	.496	.758	8939	28.22	47.08	182.37	.567	.538	1079	8583	30.52	03.52	177.04
.518	.497	.755	8942	28.25	47.16	182.38	.568	.539	1078	8579	30.55	03.55	176.95
.519	.498	.752	8945	28.28	47.24	182.40	.569	.540	1077	8574	30.58	03.58	176.86
0.520	0.499	.749	8948	28.31	47.32	182.41	0.570	0.541	1076	8570	31.01	03.70	176.76
.521	.500	.746	8951	28.34	47.40	182.43	.571	.542	1075	8565	31.04	03.74	176.67
.522	.501	.743	8954	28.37	47.48	182.44	.572	.543	1074	8561	31.07	03.77	176.58
.523	.502	.740	8957	28.40	47.56	182.46	.573	.543	1073	8556	31.10	03.78	176.49
.524	.503	.737	8960	28.43	47.64	182.47	.574	.544	1072	8552	31.13	03.79	176.40
0.525	0.504	.734	8963	28.47	47.72	182.49	0.575	0.545	1071	8548	31.16	03.80	176.31
.526	.505	.731	8966	28.50	47.80	182.50	.576	.546	1070	8543	31.19	03.81	176.22
.527	.506	.728	8969	28.53	47.88	182.51	.577	.547	1069	8539	31.22	03.82	176.13
.528	.507	.725	8972	28.56	47.96	182.53	.578	.548	1068	8534	31.25	03.83	176.04
.529	.508	.722	8975	28.59	48.04	182.54	.579	.549	1067	8530	31.28	03.84	175.95
0.530	0.509	.719	8978	29.02	48.12	182.56	0.580	0.550	1066	8525	31.31	03.85	175.86
.531	.510	.716	8981	29.05	48.20	182.57	.581	.550	1065	8521	31.34	03.86	175.77
.532	.511	.713	8984	29.08	48.28	182.59	.582	.551	1064	8516	31.37	03.87	175.68
.533	.512	.710	8987	29.11	48.36	182.60	.583	.552	1063	8512	31.40	03.88	175.59
.534	.513	.707	8990	29.14	48.44	182.61	.584	.553	1062	8508	31.43	03.89	175.50
0.535	0.514	.704	8993	29.17	48.52	182.63	0.585	0.554	1061	8503	31.46	03.90	175.41
.536	.515	.701	8996	29.20	48.60	182.64	.586	.555	1060	8499	31.49	03.91	175.32
.537	.516	.698	8999	29.23	48.68	182.65	.587	.556	1059	8494	31.52	03.92	175.23
.538	.517	.695	9002	29.26	48.76	182.67	.588	.557	1058	8490	31.55	03.93	175.14
.539	.518	.692	9005	29.29	48.84	182.68	.589	.558	1057	8485	31.58	03.94	175.05
0.540	0.519	.689	9008	29.32	48.92	182.70	0.590	0.559	1056	8481	31.61	03.95	174.96
.541	.520	.686	9011	29.35	49.00	182.71	.591	.560	1055	8476	31.64	03.96	174.87
.542	.521	.683	9014	29.38	49.08	182.73	.592	.561	1054	8472	31.67	03.97	174.78
.543	.522	.680	9017	29.41	49.16	182.74	.593	.562	1053	8467	31.70	03.98	174.69
.544	.523	.677	9020	29.44	49.24	182.76	.594	.563	1052	8463	31.73	03.99	174.60
0.545	0.524	.674	9023	29.47	49.32	182.77	0.595	0.564	1051	8458	31.76	04.00	174.51
.546	.525	.671	9026	29.50	49.40	182.79	.596	.565	1050	8454	31.79	04.01	174.42
.547	.526	.668	9029	29.53	49.48	182.80	.597	.566	1049	8449	31.82	04.02	174.33
.548	.527	.665	9032	29.56	49.56	182.82	.598	.567	1048	8445	31.85	04.03	174.24
.549	.528	.662	9035	29.59	49.64	182.83	.599	.568	1047	8440	31.88	04.04	174.15
0.550	0.529	.659	9038	30.02	49.72	182.85	0.600	0.569	1046	8436	31.91	04.05	174.06

α	$2\sin^{-1}(\sin \alpha) - \frac{\pi}{2}$	\sin	$2\sin^{-1}(\sin \alpha) - \frac{\pi}{2}$	\sin	α	$2\sin^{-1}(\sin \alpha) - \frac{\pi}{2}$	\sin	$2\sin^{-1}(\sin \alpha) - \frac{\pi}{2}$	\sin				
0.500	0.524	1096	8657	30.02	03.02	178.57	0.600	0.566	1046	8436	31.91	04.05	174.06

The Gudermannian.

u	$\operatorname{gd} u$	$\operatorname{sech} u$	$\operatorname{gd} u$	$\operatorname{sech} u$	u	$\operatorname{gd} u$	$\operatorname{sech} u$	$\operatorname{gd} u$	$\operatorname{sech} u$
0.600	0.566 9396	8435	32 28 58.85	173.99	0.690	0.608 5398	8205	34 52 00.34	169.23
.601	.567 7789	8431	32 31 52.80	173.90	.691	.609 9600	8200	34 54 40.52	169.14
.602	.568 6218	8426	32 34 46.09	173.81	.692	.610 1708	8195	34 57 20.62	169.04
.603	.569 4642	8422	32 37 40.44	173.71	.693	.610 6091	8191	35 00 27.04	168.95
.604	.570 3061	8417	32 40 31.09	173.62	.694	.611 8179	8186	35 03 16.51	168.86
0.605	0.571 1476	8413	32 43 27.66	173.53	0.695	0.612 6363	8181	35 06 05.31	168.75
.606	.571 9887	8408	32 46 21.14	173.43	.696	.613 4542	8177	35 08 51.01	168.66
.607	.572 8293	8404	32 49 14.52	173.34	.697	.614 2716	8172	35 11 42.62	168.56
.608	.573 6694	8399	32 52 07.82	173.24	.698	.615 8886	8167	35 14 31.13	168.46
.609	.574 5091	8395	32 55 01.01	173.15	.699	.615 9951	8163	35 17 19.54	168.36
0.610	0.575 3484	8390	32 57 54.12	173.06	0.660	0.616 7211	8158	35 20 07.86	168.27
.611	.576 1871	8385	33 00 47.13	172.96	.661	.617 5356	8153	35 22 50.68	168.17
.612	.577 0235	8381	33 03 40.04	172.87	.662	.618 3517	8148	35 25 44.20	168.07
.613	.577 8533	8376	33 06 32.80	172.77	.663	.619 1693	8144	35 28 32.22	167.97
.614	.578 7007	8372	33 09 25.50	172.68	.664	.619 9804	8139	35 31 20.14	167.88
0.615	0.579 5377	8367	33 12 18.22	172.59	0.665	0.620 7941	8134	35 34 07.07	167.78
.616	.580 3741	8363	33 15 10.76	172.49	.666	.621 6073	8129	35 36 55.79	167.68
.617	.581 2102	8358	33 18 03.20	172.40	.667	.622 4200	8125	35 39 43.34	167.58
.618	.582 0457	8353	33 20 55.55	172.30	.668	.623 2328	8120	35 42 30.87	167.49
.619	.582 8899	8349	33 23 47.81	172.21	.669	.624 0440	8115	35 45 18.31	167.39
0.620	0.583 7133	8344	33 26 40.07	172.11	0.670	0.624 8553	8110	35 48 05.66	167.29
.621	.584 5467	8340	33 29 32.03	172.02	.671	.625 6661	8105	35 50 52.49	167.19
.622	.585 3834	8335	33 32 24.00	171.92	.672	.626 4764	8101	35 53 40.13	167.09
.623	.586 2167	8331	33 35 15.87	171.83	.673	.627 2865	8096	35 56 27.68	166.99
.624	.587 0495	8326	33 38 07.65	171.73	.674	.628 0955	8091	35 59 14.03	166.90
0.625	0.587 8819	8321	33 40 59.34	171.64	0.675	0.628 9046	8087	36 02 00.88	166.80
.626	.588 7137	8317	33 43 50.63	171.54	.676	.629 7130	8082	36 04 47.61	166.70
.627	.589 5451	8312	33 46 42.44	171.45	.677	.630 5200	8077	36 07 34.28	166.60
.628	.590 3761	8307	33 49 33.82	171.35	.678	.631 3264	8072	36 10 20.84	166.51
.629	.591 2066	8303	33 52 25.12	171.26	.679	.632 1354	8068	36 13 07.29	166.41
0.630	0.592 0367	8298	33 55 16.33	171.16	0.680	0.632 9420	8063	36 15 53.65	166.31
.631	.592 8662	8293	33 58 07.44	171.06	.681	.633 7480	8058	36 18 39.91	166.21
.632	.593 6954	8289	34 00 58.46	170.97	.682	.634 5536	8053	36 21 26.07	166.11
.633	.594 5244	8284	34 03 49.38	170.87	.683	.635 3587	8049	36 24 12.14	166.01
.634	.595 3532	8280	34 06 40.20	170.78	.684	.636 1633	8044	36 26 58.10	165.92
0.635	0.596 1829	8275	34 09 30.03	170.68	0.685	0.636 9675	8039	36 29 43.97	165.82
.636	.597 0127	8270	34 12 21.50	170.59	.686	.637 7711	8034	36 32 29.74	165.72
.637	.597 8418	8266	34 15 12.10	170.49	.687	.638 5743	8029	36 35 15.41	165.62
.638	.598 6703	8261	34 18 02.34	170.39	.688	.639 3770	8025	36 38 00.98	165.52
.639	.599 4991	8256	34 20 52.89	170.30	.689	.640 1792	8020	36 40 46.43	165.42
0.640	0.600 3175	8251	34 23 43.14	170.20	0.690	0.640 9810	8015	36 43 31.82	165.32
.641	.601 1464	8247	34 26 33.20	170.11	.691	.641 7823	8010	36 46 17.09	165.22
.642	.601 9769	8242	34 29 23.35	170.01	.692	.642 5830	8006	36 49 02.27	165.13
.643	.602 8089	8238	34 32 13.31	169.91	.693	.643 3834	8001	36 51 47.34	165.03
.644	.603 6404	8233	34 35 03.17	169.82	.694	.644 1832	7996	36 54 32.32	164.93
0.645	0.604 4315	8228	34 37 52.94	169.72	0.695	0.644 9825	7991	36 57 17.20	164.83
.646	.605 2541	8224	34 40 42.61	169.62	.696	.645 7814	7986	37 00 01.68	164.73
.647	.606 0762	8219	34 43 32.39	169.53	.697	.646 5798	7981	37 02 46.66	164.63
.648	.606 8979	8214	34 46 21.67	169.43	.698	.647 3777	7977	37 05 31.24	164.53
.649	.607 7190	8210	34 49 11.05	169.33	.699	.648 1751	7972	37 08 15.72	164.43
0.650	0.608 5398	8205	34 52 00.34	169.24	0.700	0.648 9721	7967	37 11 00.10	164.33
u	$2 \tan^{-1}(\operatorname{sech} u) = \frac{\pi}{2}$	$\operatorname{sech} u$	$2 \tan^{-1}(\operatorname{sech} u) = \frac{\pi}{2}$	$\operatorname{sech} u$	u	$2 \tan^{-1}(\operatorname{sech} u) = \frac{\pi}{2}$	$\operatorname{sech} u$	$2 \tan^{-1}(\operatorname{sech} u) = \frac{\pi}{2}$	$\operatorname{sech} u$

The Gudermannian.

u	$gd\ u$	$\operatorname{sech} u$	$gd\ u$	$\operatorname{sech} u$	u	$gd\ u$	$\operatorname{sech} u$	$gd\ u$	$\operatorname{sech} u$
0.700	0.648 9721	7947	37 11 00.10	164.33	0.750	0.688 2014	7724	39 25 51.72	159.32
.701	.649 7686	7948	37 13 44.38	164.23	.751	.688 9735	7719	39 28 30.98	159.22
.702	.650 5645	7957	37 16 28.57	164.13	.752	.689 7451	7714	39 31 10.15	159.11
.703	.651 3600	7951	37 19 12.05	164.03	.753	.690 5163	7709	39 33 49.21	159.01
.704	.652 1550	7958	37 21 50.03	163.93	.754	.691 2870	7704	39 36 28.18	158.91
0.705	0.652 9491	7953	37 24 40.52	163.84	0.755	0.692 0572	7699	39 39 07.01	158.81
.706	.653 7430	7959	37 27 24.31	163.74	.756	.692 8269	7694	39 41 45.80	158.71
.707	.654 5374	7963	37 30 07.90	163.64	.757	.693 5961	7689	39 44 24.46	158.61
.708	.655 3323	7968	37 32 51.59	163.54	.758	.694 3648	7685	39 47 03.01	158.51
.709	.656 1269	7974	37 35 35.06	163.44	.759	.695 1330	7680	39 49 41.47	158.40
0.710	0.656 9150	7979	37 38 18.45	163.34	0.760	0.695 9007	7675	39 52 19.80	158.30
.711	.657 7067	7984	37 41 01.74	163.24	.761	.696 6679	7670	39 54 58.07	158.20
.712	.658 4978	7989	37 43 44.02	163.14	.762	.697 4347	7665	39 57 36.23	158.10
.713	.659 2885	7994	37 46 28.01	163.04	.763	.698 2009	7660	39 60 14.28	158.00
.714	.660 0787	7999	37 49 11.00	162.94	.764	.698 9667	7655	39 62 52.22	157.90
0.715	0.660 8684	7995	37 51 53.89	162.84	0.765	0.699 7319	7650	39 65 30.07	157.80
.716	.661 6576	7999	37 54 36.68	162.74	.766	.700 4967	7645	39 68 07.81	157.69
.717	.662 4461	7995	37 57 19.36	162.64	.767	.701 2610	7640	39 70 45.46	157.59
.718	.663 2340	7990	38 00 01.95	162.54	.768	.702 0248	7635	39 73 23.01	157.49
.719	.664 0213	7995	38 02 44.44	162.44	.769	.702 7880	7630	39 76 00.44	157.39
0.720	0.664 8095	7990	38 05 26.83	162.34	0.770	0.703 5508	7625	39 78 37.78	157.29
.721	.665 5961	7995	38 08 09.11	162.24	.771	.704 3131	7620	39 81 15.01	157.19
.722	.666 3827	7990	38 10 51.39	162.14	.772	.705 0750	7615	39 83 52.15	157.08
.723	.667 1685	7995	38 13 33.99	162.04	.773	.705 8363	7610	39 86 29.18	156.98
.724	.667 9539	7990	38 16 15.37	161.94	.774	.706 5971	7605	39 89 06.11	156.88
0.725	0.668 7387	7985	38 18 57.26	161.84	0.775	0.707 3574	7600	39 91 42.94	156.78
.726	.669 5231	7981	38 21 39.05	161.74	.776	.708 1173	7595	39 94 19.67	156.68
.727	.670 3069	7986	38 24 20.73	161.64	.777	.708 8760	7590	39 96 56.30	156.57
.728	.671 0903	7981	38 27 02.32	161.54	.778	.709 6351	7585	39 99 32.82	156.47
.729	.671 8732	7987	38 29 43.80	161.43	.779	.710 3938	7580	40 02 09.24	156.37
0.730	0.672 6556	7982	38 32 25.10	161.33	0.780	0.711 1516	7575	40 04 45.56	156.27
.731	.673 4370	7987	38 35 06.47	161.23	.781	.711 9090	7570	40 07 21.77	156.17
.732	.674 2180	7982	38 37 47.05	161.13	.782	.712 6659	7565	40 09 57.89	156.06
.733	.674 9980	7987	38 40 28.74	161.03	.783	.713 4223	7560	40 12 33.90	155.96
.734	.675 7784	7982	38 43 09.72	160.93	.784	.714 1781	7555	40 15 09.81	155.86
0.735	0.676 5581	7977	38 45 50.60	160.83	0.785	0.714 9335	7550	40 17 45.62	155.76
.736	.677 3379	7982	38 48 31.38	160.73	.786	.715 6881	7545	40 20 21.33	155.66
.737	.678 1169	7987	38 51 12.06	160.63	.787	.716 4428	7540	40 22 56.94	155.55
.738	.678 8954	7982	38 53 52.64	160.53	.788	.717 1967	7535	40 25 32.44	155.45
.739	.679 6734	7987	38 56 33.12	160.43	.789	.717 9501	7530	40 28 07.84	155.35
0.740	0.680 4510	7977	38 59 13.50	160.33	0.790	0.718 7030	7525	40 30 43.14	155.25
.741	.681 2290	7982	39 01 53.77	160.23	.791	.719 4554	7520	40 33 18.33	155.15
.742	.682 0065	7987	39 04 33.95	160.13	.792	.720 2073	7515	40 35 53.43	155.05
.743	.682 7840	7982	39 07 14.02	160.02	.793	.720 9588	7510	40 38 28.42	154.94
.744	.683 5615	7987	39 09 54.00	159.92	.794	.721 7097	7505	40 41 03.31	154.84
0.745	0.684 3393	7977	39 12 33.87	159.82	0.795	0.722 4601	7500	40 43 38.10	154.74
.746	.685 1169	7982	39 15 13.64	159.72	.796	.723 2101	7495	40 46 12.89	154.64
.747	.685 8940	7987	39 17 53.31	159.62	.797	.723 9595	7490	40 48 47.58	154.53
.748	.686 6715	7982	39 20 32.88	159.52	.798	.724 7084	7485	40 51 22.24	154.43
.749	.687 4487	7987	39 23 12.35	159.42	.799	.725 4569	7480	40 53 56.82	154.33
0.750	0.688 2264	7977	39 25 51.72	159.32	0.800	0.726 2048	7477	40 56 30.50	154.22
u	$2 \operatorname{tan}^{-1} \operatorname{sech} \frac{u}{2}$	$\operatorname{sech} u$	$2 \operatorname{tan}^{-1} \operatorname{sech} \frac{u}{2}$	$\operatorname{sech} u$	u	$2 \operatorname{tan}^{-1} \operatorname{sech} \frac{u}{2}$	$\operatorname{sech} u$	$2 \operatorname{tan}^{-1} \operatorname{sech} \frac{u}{2}$	$\operatorname{sech} u$

The Gudermannian.

u	$\operatorname{gd} u$	$\operatorname{sech} u$	$\operatorname{gd} u$	$\operatorname{sech} u$	u	$\operatorname{gd} u$	$\operatorname{sech} u$	$\operatorname{gd} u$	$\operatorname{sech} u$
0.800	0.746 2048	7477	41 36 30.39	154.14	0.830	0.702 0477	7235	43 44 13.68	149.00
0.801	746 5823	7474	41 36 31.67	154.12	0.831	701 9900	7232	43 45 00.48	148.98
0.802	747 0994	7469	41 41 38.74	154.02	0.832	701 4173	7228	43 47 53.31	148.88
0.803	748 4457	7462	41 44 12.71	153.93	0.833	700 1338	7223	43 50 00.47	148.79
0.804	749 1910	7457	41 46 46.57	153.85	0.834	700 8538	7219	43 52 45.89	148.69
0.805	0.749 0171	7452	41 49 26.34	153.77	0.835	0.700 5751	7215	43 55 12.51	148.57
0.806	749 0844	7447	41 51 54.00	153.69	0.836	700 2954	7212	43 57 49.03	148.47
0.807	749 4260	7444	41 54 27.90	153.59	0.837	700 0109	7208	43 59 14.43	148.36
0.808	749 7322	7437	41 57 01.03	153.49	0.838	700 7249	7205	44 02 00.29	148.25
0.809	749 9140	7434	41 59 31.49	153.40	0.839	700 4325	7201	44 05 00.00	148.16
0.810	0.749 6570	7427	42 02 07.61	153.30	0.840	0.700 1390	7197	44 07 00.00	148.06
0.811	749 6995	7422	42 04 40.70	153.20	0.841	700 8484	7194	44 10 00.00	147.95
0.812	749 7154	7417	42 07 13.81	153.09	0.842	700 5634	7191	44 12 44.68	147.85
0.813	749 8839	7412	42 09 46.75	152.98	0.843	700 2727	7187	44 15 00.00	147.75
0.814	749 9629	7407	42 12 19.50	152.89	0.844	700 0077	7183	44 17 00.00	147.64
0.815	0.749 7314	7402	42 14 52.33	152.79	0.845	0.700 7534	7179	44 19 00.00	147.54
0.816	749 7314	7397	42 17 24.69	152.69	0.846	700 4981	7175	44 22 00.00	147.44
0.817	749 8139	7392	42 19 57.50	152.58	0.847	700 2400	7171	44 24 00.00	147.33
0.818	749 8859	7387	42 22 30.03	152.48	0.848	700 0000	7167	44 27 00.00	147.23
0.819	749 9244	7383	42 25 02.25	152.38	0.849	700 7500	7163	44 29 00.00	147.13
0.820	0.749 9301	7378	42 27 34.48	152.27	0.850	0.700 5000	7159	44 31 00.00	147.02
0.821	749 9301	7373	42 30 06.60	152.17	0.851	700 2500	7155	44 33 00.00	146.92
0.822	749 9301	7368	42 32 38.62	152.07	0.852	700 0000	7151	44 35 00.00	146.82
0.823	749 9301	7363	42 35 10.53	151.96	0.853	700 7500	7147	44 37 00.00	146.72
0.824	749 9301	7358	42 37 42.34	151.86	0.854	700 5000	7143	44 39 00.00	146.61
0.825	0.749 7420	7353	42 40 14.05	151.76	0.855	0.700 2500	7139	44 41 00.00	146.51
0.826	749 7420	7348	42 42 45.60	151.66	0.856	700 0000	7135	44 43 00.00	146.41
0.827	749 7420	7343	42 45 17.12	151.55	0.857	700 7500	7131	44 45 00.00	146.31
0.828	749 7420	7338	42 47 48.62	151.45	0.858	700 5000	7127	44 47 00.00	146.21
0.829	749 7420	7333	42 50 20.17	151.35	0.859	700 2500	7123	44 49 00.00	146.10
0.830	0.749 4420	7328	42 52 51.66	151.24	0.860	0.700 0000	7119	44 51 00.00	145.99
0.831	749 4420	7323	42 55 23.11	151.13	0.861	700 7500	7115	44 53 00.00	145.89
0.832	749 8966	7318	42 57 53.15	151.03	0.862	700 5000	7111	44 55 00.00	145.79
0.833	750 0681	7313	43 00 23.04	150.91	0.863	700 2500	7107	44 57 00.00	145.68
0.834	750 1391	7308	43 02 52.83	150.81	0.864	700 0000	7103	44 59 00.00	145.58
0.835	0.750 0697	7303	43 05 23.50	150.69	0.865	0.700 7500	7099	45 01 00.00	145.48
0.836	750 0697	7298	43 07 54.08	150.59	0.866	700 5000	7095	45 03 00.00	145.37
0.837	750 5302	7293	43 10 24.90	150.48	0.867	700 2500	7091	45 05 00.00	145.27
0.838	750 5302	7288	43 12 55.03	150.37	0.868	700 0000	7087	45 07 00.00	145.17
0.839	750 9888	7283	43 15 25.20	150.26	0.869	700 7500	7083	45 09 00.00	145.06
0.840	0.750 7168	7278	43 17 57.37	150.14	0.870	0.700 5000	7079	45 11 00.00	144.96
0.841	750 7168	7273	43 20 27.43	150.03	0.871	700 2500	7075	45 13 00.00	144.86
0.842	750 7168	7268	43 22 57.30	149.91	0.872	700 0000	7071	45 15 00.00	144.75
0.843	750 7168	7263	43 25 27.25	149.81	0.873	700 7500	7067	45 17 00.00	144.65
0.844	750 7168	7258	43 27 57.01	149.70	0.874	700 5000	7063	45 19 00.00	144.55
0.845	0.750 3475	7253	43 30 26.66	149.60	0.875	0.700 2500	7059	45 21 00.00	144.45
0.846	750 3475	7248	43 32 56.21	149.50	0.876	700 0000	7055	45 23 00.00	144.34
0.847	750 7168	7243	43 35 25.65	149.39	0.877	700 7500	7051	45 25 00.00	144.24
0.848	750 7168	7238	43 37 55.00	149.29	0.878	700 5000	7047	45 27 00.00	144.14
0.849	750 7168	7233	43 40 24.24	149.19	0.879	700 2500	7043	45 29 00.00	144.03
0.850	0.750 9577	7228	43 42 53.38	149.09	0.900	0.750 4813	6998	45 44 58.40	143.03
$\operatorname{sech} u = \frac{2}{e^u + e^{-u}} \quad \operatorname{gd} u = 2 \tan^{-1}(\operatorname{sech} u) \quad \operatorname{sech} u = \frac{2}{e^u + e^{-u}} \quad \operatorname{gd} u = 2 \tan^{-1}(\operatorname{sech} u) \quad \operatorname{sech} u = \frac{2}{e^u + e^{-u}} \quad \operatorname{gd} u = 2 \tan^{-1}(\operatorname{sech} u)$									

ALICE

The Gudermannian.

θ	$\sin \theta$	$\cos \theta$	$\tan \theta$	$\cot \theta$	$\sec \theta$	$\csc \theta$	$\sec \theta$	$\csc \theta$	$\sec \theta$	$\csc \theta$
0.000	0.708 4851	0.698	15 41 58.80	143.93	0.050	0.832 7479	0.788	47 42 46.58	138.78	
0.001	0.709 1768	0.697	15 47 24.47	143.81	0.051	0.833 4405	0.787	47 45 05.31	138.68	
0.002	0.709 8769	0.696	15 49 40.45	143.72	0.052	0.834 1326	0.786	47 47 25.04	138.58	
0.003	0.710 5734	0.695	15 52 10.12	143.62	0.053	0.834 7642	0.785	47 49 49.47	138.48	
0.004	0.711 2665	0.694	15 54 33.69	143.54	0.054	0.835 4353	0.784	47 52 00.89	138.37	
0.005	0.711 9560	0.693	15 56 57.16	143.45	0.055	0.836 1059	0.783	47 54 10.22	138.27	
0.006	0.712 6421	0.692	15 59 20.52	143.37	0.056	0.836 7760	0.782	47 56 37.41	138.17	
0.007	0.713 3250	0.691	16 01 43.78	143.27	0.057	0.837 4456	0.781	47 58 55.53	138.07	
0.008	0.714 0047	0.690	16 04 06.03	143.19	0.058	0.838 1147	0.780	48 01 13.57	137.96	
0.009	0.714 6812	0.689	16 06 30.40	143.09	0.059	0.838 7833	0.779	48 03 31.48	137.86	
0.010	0.715 3553	0.688	16 08 52.05	142.99	0.060	0.839 4511	0.778	48 05 49.29	137.75	
0.011	0.716 0278	0.687	16 11 15.79	142.89	0.061	0.840 1181	0.777	48 08 07.00	137.65	
0.012	0.716 6988	0.686	16 13 38.51	142.79	0.062	0.840 7852	0.776	48 10 25.60	137.55	
0.013	0.717 3674	0.685	16 16 01.18	142.69	0.063	0.841 4528	0.775	48 12 42.00	137.45	
0.014	0.718 0345	0.684	16 18 23.72	142.59	0.064	0.842 1199	0.774	48 14 59.50	137.35	
0.015	0.718 6999	0.683	16 20 46.16	142.48	0.065	0.842 7846	0.773	48 17 16.80	137.25	
0.016	0.719 3638	0.682	16 23 08.49	142.38	0.066	0.843 4497	0.772	48 19 33.59	137.14	
0.017	0.720 0262	0.681	16 25 30.72	142.28	0.067	0.844 1144	0.771	48 21 51.49	137.04	
0.018	0.720 6871	0.680	16 27 52.85	142.18	0.068	0.844 7795	0.770	48 24 08.68	136.94	
0.019	0.721 3465	0.679	16 30 14.87	142.07	0.069	0.845 4442	0.769	48 26 24.66	136.84	
0.020	0.721 9953	0.678	16 32 36.79	141.97	0.070	0.846 1083	0.768	48 28 41.75	136.73	
0.021	0.722 6435	0.677	16 34 58.61	141.87	0.071	0.846 7788	0.767	48 30 58.41	136.63	
0.022	0.723 2911	0.676	16 37 20.33	141.76	0.072	0.847 4381	0.766	48 33 15.01	136.53	
0.023	0.723 9381	0.675	16 39 41.91	141.66	0.073	0.848 0948	0.765	48 35 31.40	136.43	
0.024	0.724 5845	0.674	16 42 03.45	141.55	0.074	0.848 7530	0.764	48 37 47.57	136.32	
0.025	0.725 2303	0.673	16 44 24.85	141.45	0.075	0.849 4136	0.763	48 40 04.14	136.22	
0.026	0.725 8756	0.672	16 46 46.16	141.35	0.076	0.850 0738	0.762	48 42 20.31	136.12	
0.027	0.726 5203	0.671	16 49 07.39	141.25	0.077	0.850 7315	0.761	48 44 36.38	136.02	
0.028	0.727 1645	0.670	16 51 28.45	141.15	0.078	0.851 3937	0.760	48 46 52.34	135.92	
0.029	0.727 8081	0.669	16 53 49.45	141.04	0.079	0.852 0514	0.759	48 49 08.21	135.81	
0.030	0.728 4512	0.668	16 56 10.34	140.94	0.080	0.852 7066	0.758	48 51 23.07	135.71	
0.031	0.729 0938	0.667	16 58 31.13	140.84	0.081	0.853 3603	0.757	48 53 39.01	135.61	
0.032	0.729 7359	0.666	17 00 51.80	140.73	0.082	0.854 0125	0.756	48 55 55.19	135.51	
0.033	0.730 3775	0.665	17 03 12.40	140.63	0.083	0.854 6612	0.755	48 58 10.61	135.40	
0.034	0.731 0186	0.664	17 05 32.88	140.53	0.084	0.855 3074	0.754	49 00 26.00	135.30	
0.035	0.731 6592	0.663	17 07 53.25	140.43	0.085	0.855 9511	0.753	49 02 41.25	135.20	
0.036	0.732 2993	0.662	17 10 13.51	140.32	0.086	0.856 5933	0.752	49 04 56.40	135.10	
0.037	0.732 9388	0.661	17 12 33.70	140.22	0.087	0.857 2330	0.751	49 07 11.44	135.00	
0.038	0.733 5779	0.660	17 14 53.77	140.12	0.088	0.857 8703	0.750	49 09 26.39	134.89	
0.039	0.734 2165	0.659	17 17 13.74	140.01	0.089	0.858 5061	0.749	49 11 41.23	134.79	
0.040	0.734 8546	0.658	17 19 33.60	139.91	0.090	0.859 1412	0.748	49 13 55.07	134.69	
0.041	0.735 4922	0.657	17 21 53.30	139.81	0.091	0.859 7756	0.747	49 16 09.01	134.59	
0.042	0.736 1293	0.656	17 24 13.02	139.71	0.092	0.860 4092	0.746	49 18 23.15	134.49	
0.043	0.736 7659	0.655	17 26 32.57	139.60	0.093	0.861 0420	0.745	49 20 38.01	134.38	
0.044	0.737 4020	0.654	17 28 52.02	139.50	0.094	0.861 6751	0.744	49 22 52.52	134.28	
0.045	0.737 9974	0.653	17 31 11.37	139.40	0.095	0.862 3076	0.743	49 25 08.15	134.18	
0.046	0.738 5922	0.652	17 33 30.62	139.30	0.096	0.862 9393	0.742	49 27 22.66	134.08	
0.047	0.739 1864	0.651	17 35 49.76	139.19	0.097	0.863 5703	0.741	49 29 37.30	133.98	
0.048	0.739 7801	0.650	17 38 08.80	139.09	0.098	0.864 2007	0.740	49 31 50.21	133.87	
0.049	0.740 3732	0.649	17 40 27.74	138.98	0.099	0.864 8305	0.739	49 34 04.05	133.77	
0.050	0.740 9657	0.648	17 42 46.58	138.87	1.000	0.865 4598	0.648	49 36 17.77	133.67	
θ	$21m^{-1}(\theta) - \frac{\pi}{2}$	$\sec \theta$	$21m^{-1}(\theta) - 90^\circ$	$\sec \theta$	θ	$21m^{-1}(\theta) - \frac{\pi}{2}$	$\sec \theta$	$21m^{-1}(\theta) - 90^\circ$	$\sec \theta$	

The Gudermannian.

u	$\sin u$	$\cos u$	$\tan u$	$\cot u$	u	$\sin u$	$\cos u$	$\tan u$	$\cot u$
1.000	0.865 7695	0.498 0271	1.735 5388	0.577 3503	1.050	0.897 5576	0.6215	1.443 8531	0.691 355
.001	.866 1771	.497 5610	1.738 2670	.578 3814	.051	.898 2809	.6230	1.447 43.11	.688.61
.002	.866 5946	.497 0918	1.741 0047	.579 4129	.052	.898 8037	.6245	1.451 01.57	.685.47
.003	.867 0121	.496 6226	1.743 7424	.580 4444	.053	.899 4266	.6260	1.454 59.08	.682.31
.004	.867 4296	.496 1534	1.746 4801	.581 4759	.054	.900 0498	.6275	1.458 16.18	.679.21
1.005	0.867 8471	0.495 6842	1.749 2178	0.582 5074	1.055	0.900 6691	0.6291	1.461 73.34	.676.11
.006	.868 2646	.495 2150	1.751 9555	.583 5389	.056	.901 2900	.6306	1.465 30.40	.673.01
.007	.868 6821	.494 7458	1.754 6932	.584 5704	.057	.901 9103	.6321	1.468 87.46	.669.91
.008	.869 0996	.494 2766	1.757 4309	.585 6019	.058	.902 5302	.6336	1.472 44.52	.666.81
.009	.869 5171	.493 8074	1.760 1686	.586 6334	.059	.903 1500	.6351	1.476 01.58	.663.71
1.010	0.869 9346	0.493 3382	1.762 9063	0.587 6649	1.060	0.903 7685	0.6367	1.479 58.64	.660.61
.011	.870 3521	.492 8690	1.765 6440	.588 6964	.061	.904 3869	.6382	1.483 15.70	.657.51
.012	.870 7696	.492 4000	1.768 3817	.589 7279	.062	.905 0054	.6397	1.486 72.76	.654.41
.013	.871 1871	.491 9308	1.771 1194	.590 7594	.063	.905 6222	.6412	1.490 29.82	.651.31
.014	.871 6046	.491 4616	1.773 8571	.591 7909	.064	.906 2392	.6427	1.493 86.88	.648.21
1.015	0.872 0221	0.490 9924	1.776 5948	0.592 8224	1.065	0.906 8557	0.6443	1.497 43.94	.645.11
.016	.872 4396	.490 5232	1.779 3325	.593 8539	.066	.907 4716	.6458	1.501 01.00	.642.01
.017	.872 8571	.490 0540	1.782 0702	.594 8854	.067	.908 0871	.6473	1.504 58.06	.638.91
.018	.873 2746	.489 5848	1.784 8079	.595 9169	.068	.908 7022	.6488	1.508 15.12	.635.81
.019	.873 6921	.489 1156	1.787 5456	.596 9484	.069	.909 3167	.6503	1.511 72.18	.632.71
1.020	0.874 1096	0.488 6464	1.790 2833	0.597 9799	1.070	0.909 9307	0.6518	1.515 29.24	.629.61
.021	.874 5271	.488 1772	1.793 0210	.599 0114	.071	.910 5443	.6533	1.518 86.30	.626.51
.022	.874 9446	.487 7080	1.795 7587	.600 0429	.072	.911 1574	.6548	1.522 43.36	.623.41
.023	.875 3621	.487 2388	1.798 4964	.601 0744	.073	.911 7700	.6563	1.526 00.42	.620.31
.024	.875 7796	.486 7696	1.801 2341	.602 1059	.074	.912 3821	.6578	1.529 57.48	.617.21
1.025	0.876 1971	0.486 3004	1.803 9718	0.603 1374	1.075	0.912 9937	0.6593	1.533 14.54	.614.11
.026	.876 6146	.485 8312	1.806 7095	.604 1689	.076	.913 6048	.6608	1.536 71.60	.611.01
.027	.877 0321	.485 3620	1.809 4472	.605 2004	.077	.914 2155	.6623	1.540 28.66	.607.91
.028	.877 4496	.484 8928	1.812 1849	.606 2319	.078	.914 8255	.6638	1.543 85.72	.604.81
.029	.877 8671	.484 4236	1.814 9226	.607 2634	.079	.915 4353	.6653	1.547 42.78	.601.71
1.030	0.878 2846	0.483 9544	1.817 6603	0.608 2949	1.080	0.916 0445	0.6668	1.550 99.84	.600.61
.031	.878 7021	.483 4852	1.820 3980	.609 3264	.081	.916 6532	.6683	1.554 56.90	.597.51
.032	.879 1196	.483 0160	1.823 1357	.610 3579	.082	.917 2615	.6698	1.558 13.96	.594.41
.033	.879 5371	.482 5468	1.825 8734	.611 3894	.083	.917 8692	.6713	1.561 71.02	.591.31
.034	.879 9546	.482 0776	1.828 6111	.612 4209	.084	.918 4765	.6728	1.565 28.08	.588.21
1.035	0.880 3721	0.481 6084	1.831 3488	0.613 4524	1.085	0.919 0833	0.6743	1.568 85.14	.585.11
.036	.880 7896	.481 1392	1.834 0865	.614 4839	.086	.919 6896	.6758	1.572 42.20	.582.01
.037	.881 2071	.480 6700	1.836 8242	.615 5154	.087	.920 2954	.6773	1.575 99.26	.578.91
.038	.881 6246	.480 2008	1.839 5619	.616 5469	.088	.920 9008	.6788	1.579 56.32	.575.81
.039	.882 0421	.479 7316	1.842 2996	.617 5784	.089	.921 5056	.6803	1.583 13.38	.572.71
1.040	0.882 4596	0.479 2624	1.845 0373	0.618 6099	1.090	0.922 1100	0.6818	1.586 70.44	.569.61
.041	.882 8771	.478 7932	1.847 7750	.619 6414	.091	.922 7130	.6833	1.590 27.50	.566.51
.042	.883 2946	.478 3240	1.850 5127	.620 6729	.092	.923 3173	.6848	1.593 84.56	.563.41
.043	.883 7121	.477 8548	1.853 2504	.621 7044	.093	.923 9203	.6863	1.597 41.62	.560.31
.044	.884 1296	.477 3856	1.855 9881	.622 7359	.094	.924 5227	.6878	1.600 98.68	.557.21
1.045	0.884 5471	0.476 9164	1.858 7258	0.623 7674	1.095	0.925 1247	0.6893	1.604 55.74	.554.11
.046	.884 9646	.476 4472	1.861 4635	.624 7989	.096	.925 7260	.6908	1.608 12.80	.551.01
.047	.885 3821	.475 9780	1.864 2012	.625 8304	.097	.926 3272	.6923	1.611 69.86	.547.91
.048	.885 7996	.475 5088	1.866 9389	.626 8619	.098	.926 9278	.6938	1.615 26.92	.544.81
.049	.886 2171	.475 0396	1.869 6766	.627 8934	.099	.927 5278	.6953	1.618 83.98	.541.71
1.050	0.886 6346	0.474 5704	1.872 4143	0.628 9249	1.100	0.928 1274	0.6968	1.622 41.04	.538.61
u	2 tan ⁻¹ (u) = $\frac{\pi}{2}$	u	2 tan ⁻¹ (u) = $\frac{\pi}{2}$	u	2 tan ⁻¹ (u) = $\frac{\pi}{2}$	u	2 tan ⁻¹ (u) = $\frac{\pi}{2}$	u	2 tan ⁻¹ (u) = $\frac{\pi}{2}$

SMITHSONIAN TABLES

The Gudermannian.

u	$\sin u$	$\cos u$	$\tan u$	$\cot u$	u	$\sin u$	$\cos u$	$\tan u$	$\cot u$
1.100	0.8912	0.4596	1.9398	0.5154	1.150	0.9057	0.4308	2.1020	0.4755
1.101	0.8918	0.4592	1.9403	0.5150	1.151	0.9063	0.4304	2.1025	0.4751
1.102	0.8924	0.4588	1.9408	0.5146	1.152	0.9069	0.4300	2.1030	0.4747
1.103	0.8930	0.4584	1.9413	0.5142	1.153	0.9075	0.4296	2.1035	0.4743
1.104	0.8936	0.4580	1.9418	0.5138	1.154	0.9081	0.4292	2.1040	0.4739
1.105	0.8942	0.4576	1.9423	0.5134	1.155	0.9087	0.4288	2.1045	0.4735
1.106	0.8948	0.4572	1.9428	0.5130	1.156	0.9093	0.4284	2.1050	0.4731
1.107	0.8954	0.4568	1.9433	0.5126	1.157	0.9099	0.4280	2.1055	0.4727
1.108	0.8960	0.4564	1.9438	0.5122	1.158	0.9105	0.4276	2.1060	0.4723
1.109	0.8966	0.4560	1.9443	0.5118	1.159	0.9111	0.4272	2.1065	0.4719
1.110	0.8972	0.4556	1.9448	0.5114	1.160	0.9117	0.4268	2.1070	0.4715
1.111	0.8978	0.4552	1.9453	0.5110	1.161	0.9123	0.4264	2.1075	0.4711
1.112	0.8984	0.4548	1.9458	0.5106	1.162	0.9129	0.4260	2.1080	0.4707
1.113	0.8990	0.4544	1.9463	0.5102	1.163	0.9135	0.4256	2.1085	0.4703
1.114	0.8996	0.4540	1.9468	0.5098	1.164	0.9141	0.4252	2.1090	0.4699
1.115	0.9002	0.4536	1.9473	0.5094	1.165	0.9147	0.4248	2.1095	0.4695
1.116	0.9008	0.4532	1.9478	0.5090	1.166	0.9153	0.4244	2.1100	0.4691
1.117	0.9014	0.4528	1.9483	0.5086	1.167	0.9159	0.4240	2.1105	0.4687
1.118	0.9020	0.4524	1.9488	0.5082	1.168	0.9165	0.4236	2.1110	0.4683
1.119	0.9026	0.4520	1.9493	0.5078	1.169	0.9171	0.4232	2.1115	0.4679
1.120	0.9032	0.4516	1.9498	0.5074	1.170	0.9177	0.4228	2.1120	0.4675
1.121	0.9038	0.4512	1.9503	0.5070	1.171	0.9183	0.4224	2.1125	0.4671
1.122	0.9044	0.4508	1.9508	0.5066	1.172	0.9189	0.4220	2.1130	0.4667
1.123	0.9050	0.4504	1.9513	0.5062	1.173	0.9195	0.4216	2.1135	0.4663
1.124	0.9056	0.4500	1.9518	0.5058	1.174	0.9201	0.4212	2.1140	0.4659
1.125	0.9062	0.4496	1.9523	0.5054	1.175	0.9207	0.4208	2.1145	0.4655
1.126	0.9068	0.4492	1.9528	0.5050	1.176	0.9213	0.4204	2.1150	0.4651
1.127	0.9074	0.4488	1.9533	0.5046	1.177	0.9219	0.4200	2.1155	0.4647
1.128	0.9080	0.4484	1.9538	0.5042	1.178	0.9225	0.4196	2.1160	0.4643
1.129	0.9086	0.4480	1.9543	0.5038	1.179	0.9231	0.4192	2.1165	0.4639
1.130	0.9092	0.4476	1.9548	0.5034	1.180	0.9237	0.4188	2.1170	0.4635
1.131	0.9098	0.4472	1.9553	0.5030	1.181	0.9243	0.4184	2.1175	0.4631
1.132	0.9104	0.4468	1.9558	0.5026	1.182	0.9249	0.4180	2.1180	0.4627
1.133	0.9110	0.4464	1.9563	0.5022	1.183	0.9255	0.4176	2.1185	0.4623
1.134	0.9116	0.4460	1.9568	0.5018	1.184	0.9261	0.4172	2.1190	0.4619
1.135	0.9122	0.4456	1.9573	0.5014	1.185	0.9267	0.4168	2.1195	0.4615
1.136	0.9128	0.4452	1.9578	0.5010	1.186	0.9273	0.4164	2.1200	0.4611
1.137	0.9134	0.4448	1.9583	0.5006	1.187	0.9279	0.4160	2.1205	0.4607
1.138	0.9140	0.4444	1.9588	0.5002	1.188	0.9285	0.4156	2.1210	0.4603
1.139	0.9146	0.4440	1.9593	0.4998	1.189	0.9291	0.4152	2.1215	0.4599
1.140	0.9152	0.4436	1.9598	0.4994	1.190	0.9297	0.4148	2.1220	0.4595
1.141	0.9158	0.4432	1.9603	0.4990	1.191	0.9303	0.4144	2.1225	0.4591
1.142	0.9164	0.4428	1.9608	0.4986	1.192	0.9309	0.4140	2.1230	0.4587
1.143	0.9170	0.4424	1.9613	0.4982	1.193	0.9315	0.4136	2.1235	0.4583
1.144	0.9176	0.4420	1.9618	0.4978	1.194	0.9321	0.4132	2.1240	0.4579
1.145	0.9182	0.4416	1.9623	0.4974	1.195	0.9327	0.4128	2.1245	0.4575
1.146	0.9188	0.4412	1.9628	0.4970	1.196	0.9333	0.4124	2.1250	0.4571
1.147	0.9194	0.4408	1.9633	0.4966	1.197	0.9339	0.4120	2.1255	0.4567
1.148	0.9200	0.4404	1.9638	0.4962	1.198	0.9345	0.4116	2.1260	0.4563
1.149	0.9206	0.4400	1.9643	0.4958	1.199	0.9351	0.4112	2.1265	0.4559
1.150	0.9212	0.4396	1.9648	0.4954	1.200	0.9357	0.4108	2.1270	0.4555
1.151	0.9218	0.4392	1.9653	0.4950	1.201	0.9363	0.4104	2.1275	0.4551
1.152	0.9224	0.4388	1.9658	0.4946	1.202	0.9369	0.4100	2.1280	0.4547
1.153	0.9230	0.4384	1.9663	0.4942	1.203	0.9375	0.4096	2.1285	0.4543
1.154	0.9236	0.4380	1.9668	0.4938	1.204	0.9381	0.4092	2.1290	0.4539
1.155	0.9242	0.4376	1.9673	0.4934	1.205	0.9387	0.4088	2.1295	0.4535
1.156	0.9248	0.4372	1.9678	0.4930	1.206	0.9393	0.4084	2.1300	0.4531
1.157	0.9254	0.4368	1.9683	0.4926	1.207	0.9399	0.4080	2.1305	0.4527
1.158	0.9260	0.4364	1.9688	0.4922	1.208	0.9405	0.4076	2.1310	0.4523
1.159	0.9266	0.4360	1.9693	0.4918	1.209	0.9411	0.4072	2.1315	0.4519
1.160	0.9272	0.4356	1.9698	0.4914	1.210	0.9417	0.4068	2.1320	0.4515
1.161	0.9278	0.4352	1.9703	0.4910	1.211	0.9423	0.4064	2.1325	0.4511
1.162	0.9284	0.4348	1.9708	0.4906	1.212	0.9429	0.4060	2.1330	0.4507
1.163	0.9290	0.4344	1.9713	0.4902	1.213	0.9435	0.4056	2.1335	0.4503
1.164	0.9296	0.4340	1.9718	0.4898	1.214	0.9441	0.4052	2.1340	0.4499
1.165	0.9302	0.4336	1.9723	0.4894	1.215	0.9447	0.4048	2.1345	0.4495
1.166	0.9308	0.4332	1.9728	0.4890	1.216	0.9453	0.4044	2.1350	0.4491
1.167	0.9314	0.4328	1.9733	0.4886	1.217	0.9459	0.4040	2.1355	0.4487
1.168	0.9320	0.4324	1.9738	0.4882	1.218	0.9465	0.4036	2.1360	0.4483
1.169	0.9326	0.4320	1.9743	0.4878	1.219	0.9471	0.4032	2.1365	0.4479
1.170	0.9332	0.4316	1.9748	0.4874	1.220	0.9477	0.4028	2.1370	0.4475
1.171	0.9338	0.4312	1.9753	0.4870	1.221	0.9483	0.4024	2.1375	0.4471
1.172	0.9344	0.4308	1.9758	0.4866	1.222	0.9489	0.4020	2.1380	0.4467
1.173	0.9350	0.4304	1.9763	0.4862	1.223	0.9495	0.4016	2.1385	0.4463
1.174	0.9356	0.4300	1.9768	0.4858	1.224	0.9501	0.4012	2.1390	0.4459
1.175	0.9362	0.4296	1.9773	0.4854	1.225	0.9507	0.4008	2.1395	0.4455
1.176	0.9368	0.4292	1.9778	0.4850	1.226	0.9513	0.4004	2.1400	0.4451
1.177	0.9374	0.4288	1.9783	0.4846	1.227	0.9519	0.4000	2.1405	0.4447
1.178	0.9380	0.4284	1.9788	0.4842	1.228	0.9525	0.3996	2.1410	0.4443
1.179	0.9386	0.4280	1.9793	0.4838	1.229	0.9531	0.3992	2.1415	0.4439
1.180	0.9392	0.4276	1.9798	0.4834	1.230	0.9537	0.3988	2.1420	0.4435
1.181	0.9398	0.4272	1.9803	0.4830	1.231	0.9543	0.3984	2.1425	0.4431
1.182	0.9404	0.4268	1.9808	0.4826	1.232	0.9549	0.3980	2.1430	0.4427
1.183	0.9410	0.4264	1.9813	0.4822	1.233	0.9555	0.3976	2.1435	0.4423
1.184	0.9416	0.4260	1.9818	0.4818	1.234	0.9561	0.3972	2.1440	0.4419
1.185	0.9422	0.4256	1.9823	0.4814	1.235	0.9567	0.3968	2.1445	0.4415
1.186	0.9428	0.4252	1.9828	0.4810	1.236	0.9573	0.3964	2.1450	0.4411
1.187	0.9434	0.4248	1.9833	0.4806	1.237	0.9579	0.3960	2.1455	0.4407
1.188	0.9440	0.4244	1.9838	0.4802	1.238	0.9585	0.3956	2.1460	0.4403
1.189	0.9446	0.4240	1.9843	0.4798	1.239	0.9591	0.3952	2.1465	0.4399
1.190	0.9452	0.4236	1.9848	0.4794	1.240	0.9597	0.3948	2.1470	0.4395
1.191	0.9458	0.4232	1.9853	0.4790	1.241	0.9603	0.3944	2.1475	0.4391
1.192	0.9464	0.4228	1.9858	0.4786	1.242	0.9609	0.3940	2.1480	0.4387
1.193	0.9470	0.4224	1.9863	0.4782	1.243	0.9615	0.3936	2.1485	0.4383
1.194	0.9476	0.4220	1.9868	0.4778	1.244	0.9621	0.3932	2.1490	0.4379
1.195	0.9482	0.4216	1.9873	0.4774	1.245	0.9627	0.3928	2.1495	0.4375
1.196	0.9488	0.4212	1.9878	0.4770	1.246	0.9633	0.3924	2.1500	0.4371
1.197	0.9494	0.4208	1.9883	0.4766	1.247	0.9639	0.3920	2.1505	0.4367
1.198	0.9500	0.4204	1.9888	0.4762	1.248	0.9645	0.3916	2.1510	0.4363
1.199	0.9506	0.4200	1.9893	0.4758	1.249	0.9651	0.3912	2.1515	0.4359
1.200	0.9512	0.4196	1.9898	0.4754	1.250	0.9657	0.3908	2.1520	0.4355

GUTHRIE'S TABLES

x	$\sin x$	$\cos x$	$\tan x$	$\cot x$	x	$\sin x$	$\cos x$	$\tan x$	$\cot x$
1.200	0.938 6022	5523	56 38 33.62	113.02	1.250	1.012 7336	5305	58 04 31.72	109.23
.201	.939 2413	5518	56 30 27.49	113.82	.251	.013 2619	5299	58 13 26.86	109.13
.202	.940 7950	5514	56 32 21.25	114.73	.252	.013 7938	5296	58 05 06.68	109.04
.203	.942 3670	5509	56 34 14.94	115.63	.253	.014 3222	5292	58 06 58.48	108.95
.204	.943 9577	5504	56 36 08.53	116.54	.254	.014 8504	5287	58 08 47.88	108.86
1.205	0.946 4470	5500	56 38 02.02	117.44	1.255	1.015 3777	5283	58 10 36.66	108.76
.206	.948 9377	5495	56 39 55.42	118.35	.256	.015 9048	5279	58 12 25.10	108.67
.207	.950 5170	5491	56 41 48.79	119.25	.257	.016 4311	5274	58 14 14.03	108.58
.208	.952 0958	5486	56 43 41.02	120.16	.258	.016 9576	5270	58 16 02.50	108.49
.209	.953 6442	5482	56 45 35.03	121.06	.259	.017 4843	5265	58 17 51.00	108.39
1.210	0.956 1921	5477	56 47 28.05	121.97	1.260	1.018 0086	5261	58 19 39.35	108.30
.211	.958 7397	5472	56 49 20.97	122.88	.261	.018 5335	5257	58 21 27.46	108.21
.212	.960 2866	5468	56 51 13.80	123.78	.262	.019 0578	5252	58 23 15.77	108.12
.213	.961 8331	5463	56 53 06.54	124.69	.263	.019 5818	5247	58 25 03.84	108.03
.214	.963 3792	5459	56 54 59.17	125.59	.264	.020 1053	5243	58 26 51.82	107.93
1.215	0.965 9249	5454	56 56 51.72	126.50	1.265	1.020 6283	5238	58 28 39.71	107.84
.216	.968 4700	5449	56 58 44.17	127.40	.266	.021 1510	5234	58 30 27.50	107.75
.217	.970 0148	5445	57 00 36.53	128.31	.267	.021 6731	5230	58 32 15.21	107.66
.218	.971 5590	5440	57 02 28.79	129.22	.268	.022 1948	5225	58 34 02.82	107.57
.219	.973 1028	5436	57 04 20.96	130.12	.269	.022 7161	5220	58 35 50.31	107.47
1.220	0.975 6462	5431	57 06 13.03	131.03	1.270	1.023 2390	5216	58 37 37.77	107.38
.221	.977 1894	5427	57 08 05.01	131.93	.271	.023 7573	5212	58 39 25.10	107.29
.222	.978 7313	5422	57 09 56.90	132.84	.272	.024 2752	5207	58 41 12.35	107.20
.223	.980 2725	5418	57 11 48.60	133.74	.273	.024 7927	5203	58 43 00.50	107.11
.224	.981 8139	5413	57 13 40.39	134.65	.274	.025 3108	5198	58 44 48.59	107.02
1.225	0.984 3561	5408	57 15 32.19	135.56	1.275	1.025 8341	5194	58 46 36.53	106.93
.226	.985 8969	5404	57 17 23.91	136.46	.276	.026 3520	5190	58 48 24.41	106.84
.227	1.000 4359	5399	57 19 15.42	137.37	.277	.026 8703	5185	58 50 12.30	106.74
.228	.988 0766	5395	57 21 06.84	138.28	.278	.027 3886	5181	58 52 00.50	106.65
.229	.989 5178	5390	57 22 57.47	139.18	.279	.027 9041	5176	58 53 48.50	106.56
1.230	1.002 0596	5386	57 24 48.60	140.09	1.280	1.028 4208	5172	58 55 36.02	106.47
.231	.994 6039	5381	57 26 39.64	140.99	.281	.028 9370	5167	58 57 23.41	106.38
.232	.996 1490	5377	57 28 30.50	141.90	.282	.029 4533	5163	58 59 10.77	106.29
.233	.997 6943	5372	57 30 21.15	142.81	.283	.030 0673	5158	59 00 58.00	106.19
.234	.999 2393	5368	57 32 12.21	143.71	.284	.030 5819	5154	59 02 44.16	106.10
1.235	1.001 7848	5363	57 34 02.88	144.62	1.285	1.030 9061	5150	59 04 30.22	106.01
.236	.999 3270	5359	57 35 53.45	145.53	.286	.031 4209	5145	59 06 16.10	105.92
.237	.999 8695	5354	57 37 43.93	146.43	.287	.031 9362	5141	59 08 02.00	105.83
.238	.999 4127	5349	57 39 34.32	147.34	.288	.032 4510	5136	59 09 47.85	105.74
.239	.999 9553	5345	57 41 24.61	148.25	.289	.032 9653	5132	59 11 33.54	105.65
1.240	1.002 4977	5340	57 43 14.82	149.15	1.290	1.033 4805	5128	59 13 19.18	105.56
.241	.999 0415	5336	57 45 04.92	150.06	.291	.034 0950	5123	59 15 04.66	105.47
.242	.999 5849	5331	57 46 54.94	150.97	.292	.034 6091	5119	59 16 50.08	105.38
.243	.999 1281	5327	57 48 44.80	151.88	.293	.035 1238	5114	59 18 35.41	105.29
.244	.999 6713	5322	57 50 34.69	152.78	.294	.035 6381	5110	59 20 20.66	105.20
1.245	1.002 2133	5318	57 52 24.43	153.69	1.295	1.035 1538	5105	59 22 05.81	105.11
.246	.999 7561	5313	57 54 14.17	154.60	.296	.035 6691	5101	59 23 50.87	105.02
.247	.999 3000	5309	57 56 03.82	155.50	.297	.036 1840	5097	59 25 35.84	104.93
.248	.999 8440	5304	57 57 53.48	156.41	.298	.036 6985	5093	59 27 20.72	104.84
.249	.999 3882	5300	57 59 43.01	157.32	.299	.037 2125	5088	59 29 05.51	104.74
1.250	1.002 7336	5295	58 01 31.72	158.23	1.300	1.038 6961	5084	59 30 50.21	104.65
x	$2 \tan^{-1}(\tan \frac{x}{2})$	$\frac{1}{\cosh u}$	$2 \tanh^{-1}(\tanh \frac{u}{2})$	$\frac{1}{\sinh u}$	x	$2 \tan^{-1}(\tan \frac{x}{2})$	$\frac{1}{\cosh u}$	$2 \tanh^{-1}(\tanh \frac{u}{2})$	$\frac{1}{\sinh u}$

GUDERMANN TABLE

The Gudermannian.

u	ϕu	$\operatorname{sech} u$	ϕu	$\operatorname{sech} u$	u	ϕu	$\operatorname{sech} u$	ϕu	$\operatorname{sech} u$
1.300	1.038 6161	9021	59 30 38.21	104.65	1.350	1.063 4837	4858	60 55 59.37	100.21
.301	.039 1643	9000	59 34 22.82	104.59	.351	.063 9594	4854	60 57 20.43	100.12
.302	.039 6900	8978	59 37 07.34	104.57	.352	.064 4340	4850	60 59 19.51	100.03
.303	.040 1763	8956	59 39 51.77	104.55	.353	.064 9393	4846	61 00 59.50	99.95
.304	.040 6812	8935	59 42 36.10	104.50	.354	.065 4437	4841	61 02 39.41	99.86
1.305	1.041 1876	8912	59 45 20.35	104.50	1.355	1.065 9070	4837	61 04 19.22	99.77
.306	.041 6920	8890	59 48 04.51	104.44	.356	.066 3911	4833	61 05 58.05	99.69
.307	.042 1971	8868	59 50 48.98	104.42	.357	.066 8742	4829	61 07 38.50	99.60
.308	.042 7012	8846	59 53 32.56	104.43	.358	.067 3588	4824	61 09 18.15	99.51
.309	.043 2059	8825	59 56 16.45	104.41	.359	.067 8430	4820	61 10 57.61	99.42
1.310	1.043 7081	8802	59 58 00.25	104.36	1.360	1.068 3209	4816	61 12 36.99	99.34
.311	.044 2109	8780	59 59 43.95	104.37	.361	.068 8022	4812	61 14 16.20	99.25
.312	.044 7133	8758	60 01 27.58	104.38	.362	.069 2832	4808	61 15 55.49	99.16
.313	.045 2152	8737	60 03 11.11	104.39	.363	.069 7637	4803	61 17 34.61	99.08
.314	.045 7167	8715	60 04 54.55	104.40	.364	.070 2439	4799	61 19 13.64	98.99
1.315	1.046 2178	8693	60 06 37.91	104.31	1.365	1.070 7236	4795	61 20 52.30	98.90
.316	.046 7184	8671	60 08 21.17	104.32	.366	.071 2026	4791	61 22 31.45	98.82
.317	.047 2186	8650	60 10 04.31	104.33	.367	.071 6817	4786	61 24 10.22	98.73
.318	.047 7181	8628	60 11 47.41	104.34	.368	.072 1601	4782	61 25 48.90	98.64
.319	.048 2177	8606	60 13 30.42	104.35	.369	.072 6384	4778	61 27 27.50	98.56
1.320	1.048 7166	8584	60 15 13.33	104.26	1.370	1.073 1158	4774	61 29 06.01	98.47
.321	.049 2151	8562	60 16 56.11	104.27	.371	.073 5929	4770	61 30 44.64	98.38
.322	.049 7131	8540	60 18 38.97	104.28	.372	.074 0707	4766	61 32 22.78	98.30
.323	.050 2107	8518	60 20 21.51	104.29	.373	.074 5480	4761	61 34 01.03	98.21
.324	.050 7079	8496	60 22 04.06	104.30	.374	.075 0246	4757	61 35 39.20	98.12
1.325	1.051 2046	8474	60 23 46.52	104.22	1.375	1.075 5005	4753	61 37 17.28	98.04
.326	.051 7000	8452	60 25 28.80	104.23	.376	.075 9745	4749	61 38 55.27	97.95
.327	.052 1968	8430	60 27 11.17	104.24	.377	.076 4472	4745	61 40 33.18	97.86
.328	.052 6923	8408	60 28 53.37	104.25	.378	.076 9185	4740	61 42 11.00	97.78
.329	.053 1873	8386	60 30 35.47	104.26	.379	.077 3883	4736	61 43 48.73	97.69
1.330	1.053 6819	8364	60 32 17.49	104.17	1.380	1.077 8677	4732	61 45 26.38	97.61
.331	.054 1760	8342	60 34 00.41	104.18	.381	.078 3417	4728	61 47 03.94	97.52
.332	.054 6688	8320	60 35 41.25	104.19	.382	.078 8143	4724	61 48 41.42	97.43
.333	.055 1631	8298	60 37 23.00	104.21	.383	.079 2865	4720	61 50 18.81	97.35
.334	.055 6559	8276	60 39 04.67	104.22	.384	.079 7582	4715	61 51 56.12	97.26
1.335	1.056 1481	8254	60 40 46.21	104.13	1.385	1.080 2295	4711	61 53 33.34	97.18
.336	.056 6401	8232	60 42 27.72	104.14	.386	.080 7005	4707	61 55 10.47	97.09
.337	.057 1320	8210	60 44 09.12	104.15	.387	.081 1710	4703	61 56 47.52	97.01
.338	.057 6231	8188	60 45 50.43	104.16	.388	.081 6411	4699	61 58 24.48	96.92
.339	.058 1122	8166	60 47 31.05	104.17	.389	.082 1107	4695	61 60 01.36	96.83
1.340	1.058 6042	8144	60 49 12.78	104.09	1.390	1.082 5800	4691	61 61 38.15	96.75
.341	.059 0960	8122	60 50 53.83	104.10	.391	.083 0488	4686	61 63 14.86	96.66
.342	.059 5875	8100	60 52 34.78	104.11	.392	.083 5173	4682	61 64 51.48	96.58
.343	.060 0745	8078	60 54 15.05	104.12	.393	.083 9853	4678	61 66 28.01	96.49
.344	.060 5611	8056	60 55 55.33	104.14	.394	.084 4529	4674	61 68 04.46	96.41
1.345	1.061 0493	8034	60 57 35.12	104.05	1.395	1.084 9201	4670	61 69 40.83	96.32
.346	.061 5370	8012	60 59 14.73	104.06	.396	.085 3868	4666	61 71 17.11	96.24
.347	.062 0243	7990	60 59 58.21	104.07	.397	.085 8532	4662	61 72 53.30	96.15
.348	.062 5112	7968	60 59 42.07	104.08	.398	.086 3192	4657	61 74 29.41	96.07
.349	.063 0077	7946	60 59 26.01	104.09	.399	.086 7847	4653	61 76 05.64	95.98
1.350	1.063 4837	7924	60 55 59.27	100.21	1.400	1.087 2498	4649	61 77 41.37	95.90
u	$2 \tan^{-1}(\operatorname{sech} u) - \frac{\pi}{2}$	$\operatorname{sech} u$	$2 \tan^{-1}(\operatorname{sech} u) - \frac{\pi}{2}$	$\operatorname{sech} u$	u	$2 \tan^{-1}(\operatorname{sech} u) - \frac{\pi}{2}$	$\operatorname{sech} u$	$2 \tan^{-1}(\operatorname{sech} u) - \frac{\pi}{2}$	$\operatorname{sech} u$

The Gudermannian.

u	$gd\ u$	$\sec u$	$gd\ u$	$\sec u$	u	$gd\ u$	$\sec u$	$gd\ u$	$\sec u$
1.400	1.087 2808	4640	62 17 41.27	95.90	1.430	1.100 0869	4447	63 35 51.24	91.72
401	087 7145	4645	62 19 17.23	95.81	451	110 4314	4443	63 37 22.02	91.64
402	088 1788	4641	62 20 53.00	95.73	452	110 8755	4439	63 38 54.59	91.56
403	088 6427	4637	62 22 28.68	95.64	453	111 3198	4435	63 40 26.03	91.47
404	089 1062	4633	62 24 04.28	95.56	454	111 7624	4431	63 41 57.40	91.39
1.405	1.089 5695	4629	62 25 39.80	95.47	1.455	1.112 2053	4427	63 43 28.82	91.31
406	090 0330	4625	62 27 15.23	95.39	456	112 6478	4423	63 45 00.08	91.23
407	090 4942	4620	62 28 50.58	95.30	457	113 0899	4419	63 46 31.27	91.15
408	090 9591	4616	62 30 25.84	95.22	458	113 5316	4415	63 48 02.38	91.07
409	091 4175	4612	62 32 01.02	95.14	459	113 9729	4411	63 49 33.49	90.98
1.410	1.091 8785	4608	62 33 36.11	95.05	1.460	1.114 4138	4407	63 51 04.35	90.90
411	092 3391	4604	62 35 11.12	94.97	461	114 8543	4403	63 52 35.21	90.82
412	092 7993	4600	62 36 46.04	94.88	462	115 2944	4399	63 54 05.09	90.74
413	093 2591	4596	62 38 20.88	94.80	463	115 7341	4395	63 55 35.08	90.66
414	093 7185	4592	62 39 55.64	94.71	464	116 1734	4391	63 57 07.30	90.58
1.415	1.094 1775	4588	62 41 30.31	94.63	1.465	1.116 6124	4387	63 58 37.83	90.49
416	094 6361	4584	62 43 04.90	94.55	466	117 0509	4383	63 59 08.29	90.41
417	095 0942	4580	62 44 39.40	94.46	467	117 4890	4379	64 01 38.66	90.33
418	095 5520	4576	62 46 13.82	94.38	468	117 9268	4375	64 03 08.05	90.25
419	096 0094	4571	62 47 48.16	94.29	469	118 3641	4372	64 04 30.16	90.17
1.420	1.096 4693	4567	62 49 22.41	94.21	1.470	1.118 8011	4368	64 05 59.29	90.09
421	096 9288	4563	62 50 56.58	94.13	471	119 2377	4364	64 07 29.34	90.01
422	097 3790	4559	62 52 30.66	94.04	472	119 6738	4360	64 09 00.31	89.93
423	097 8347	4555	62 54 04.66	93.96	473	120 1096	4356	64 10 30.19	89.85
424	098 2900	4551	62 55 38.58	93.88	474	120 5430	4352	64 12 00.00	89.77
1.425	1.098 7149	4547	62 57 12.41	93.79	1.475	1.120 9800	4348	64 13 28.72	89.68
426	099 1694	4543	62 58 46.16	93.71	476	121 4146	4344	64 15 08.37	89.60
427	099 6350	4539	62 59 19.83	93.63	477	121 8488	4340	64 16 47.93	89.52
428	100 1093	4535	63 01 53.41	93.54	478	122 2826	4336	64 18 27.41	89.44
429	100 5606	4531	63 03 26.91	93.46	479	122 7161	4332	64 19 56.81	89.36
1.430	1.101 0134	4527	63 05 00.33	93.37	1.480	1.123 1491	4328	64 21 26.13	89.28
431	101 4699	4523	63 06 33.60	93.29	481	123 5818	4325	64 22 55.37	89.20
432	101 9180	4519	63 08 06.91	93.21	482	124 0149	4321	64 24 24.53	89.12
433	102 3607	4515	63 09 40.08	93.13	483	124 4499	4317	64 25 53.61	89.04
434	102 8210	4511	63 11 13.16	93.04	484	124 8774	4313	64 27 22.61	88.96
1.435	1.103 2719	4507	63 12 46.16	92.96	1.485	1.125 3085	4309	64 28 51.53	88.88
436	103 7223	4503	63 14 19.08	92.88	486	125 7302	4305	64 30 20.37	88.80
437	104 1724	4499	63 15 51.91	92.79	487	126 1505	4301	64 31 49.13	88.72
438	104 6221	4495	63 17 24.60	92.71	488	126 5694	4297	64 32 57.81	88.64
439	105 0714	4491	63 18 57.33	92.63	489	127 0289	4293	64 34 26.41	88.56
1.440	1.105 5262	4487	63 20 29.92	92.54	1.490	1.127 4581	4289	64 35 54.93	88.48
441	105 9787	4483	63 22 02.42	92.46	491	127 8869	4285	64 37 23.37	88.40
442	106 4308	4479	63 23 34.84	92.38	492	128 3152	4282	64 38 51.72	88.32
443	106 8844	4475	63 25 07.18	92.30	493	128 7432	4278	64 40 20.00	88.24
444	107 3317	4471	63 26 39.44	92.21	494	129 1708	4274	64 41 48.20	88.16
1.445	1.107 7586	4467	63 28 11.62	92.13	1.495	1.129 5980	4270	64 43 16.32	88.08
446	108 2050	4463	63 29 43.70	92.05	496	130 0269	4266	64 44 44.36	88.00
447	108 6511	4459	63 31 15.71	91.97	497	130 4513	4263	64 46 12.32	87.92
448	109 0908	4455	63 32 47.63	91.88	498	130 8774	4259	64 47 40.20	87.84
449	109 5391	4451	63 34 19.48	91.80	499	131 3031	4255	64 49 08.01	87.76
1.450	1.109 9869	4447	63 35 51.24	91.72	1.500	1.131 7283	4251	64 50 35.73	87.68
u	$2 \tan^{-1}(\sec u)$	$\sec u$	$2 \tan^{-1}(\sec u)$	$\sec u$	u	$2 \tan^{-1}(\sec u)$	$\sec u$	$2 \tan^{-1}(\sec u)$	$\sec u$

SMITHSONIAN TABLES

The Gudermannian.

x	$\sinh x$	$\cosh x$	$\tanh x$	$\operatorname{sech} x$	x	$\sinh x$	$\cosh x$	$\tanh x$	$\operatorname{sech} x$
1.500	1.131 7583	4.251	0.267 551 8	0.377 382 9	1.550	1.152 5078	4.065	0.283 01 81	0.352 98
1.501	1.132 1532	4.247	0.267 551 8	0.377 382 9	1.551	1.152 9130	4.058	0.283 01 81	0.352 98
1.502	1.132 5578	4.243	0.267 551 8	0.377 382 9	1.552	1.153 3195	4.055	0.283 01 81	0.352 98
1.503	1.132 9619	4.239	0.267 551 8	0.377 382 9	1.553	1.153 7248	4.051	0.283 01 81	0.352 98
1.504	1.133 4157	4.236	0.267 551 8	0.377 382 9	1.554	1.154 1297	4.047	0.283 01 81	0.352 98
1.505	1.133 8300	4.232	0.267 551 8	0.377 382 9	1.555	1.154 5342	4.043	0.283 01 81	0.352 98
1.506	1.134 2737	4.228	0.267 551 8	0.377 382 9	1.556	1.154 9384	4.039	0.283 01 81	0.352 98
1.507	1.134 6966	4.224	0.267 551 8	0.377 382 9	1.557	1.155 3421	4.036	0.283 01 81	0.352 98
1.508	1.135 1168	4.220	0.267 551 8	0.377 382 9	1.558	1.155 7456	4.032	0.283 01 81	0.352 98
1.509	1.135 5377	4.216	0.267 551 8	0.377 382 9	1.559	1.156 1489	4.029	0.283 01 81	0.352 98
1.510	1.135 9601	4.213	0.267 551 8	0.377 382 9	1.560	1.156 5513	4.025	0.283 01 81	0.352 98
1.511	1.136 3812	4.209	0.267 551 8	0.377 382 9	1.561	1.156 9539	4.021	0.283 01 81	0.352 98
1.512	1.136 8019	4.205	0.267 551 8	0.377 382 9	1.562	1.157 3566	4.018	0.283 01 81	0.352 98
1.513	1.137 2212	4.201	0.267 551 8	0.377 382 9	1.563	1.157 7591	4.014	0.283 01 81	0.352 98
1.514	1.137 6412	4.197	0.267 551 8	0.377 382 9	1.564	1.158 1613	4.010	0.283 01 81	0.352 98
1.515	1.138 0617	4.194	0.267 551 8	0.377 382 9	1.565	1.158 5632	4.007	0.283 01 81	0.352 98
1.516	1.138 4818	4.190	0.267 551 8	0.377 382 9	1.566	1.158 9657	4.003	0.283 01 81	0.352 98
1.517	1.138 9016	4.186	0.267 551 8	0.377 382 9	1.567	1.159 3685	3.999	0.283 01 81	0.352 98
1.518	1.139 3210	4.182	0.267 551 8	0.377 382 9	1.568	1.159 7715	3.995	0.283 01 81	0.352 98
1.519	1.139 7399	4.178	0.267 551 8	0.377 382 9	1.569	1.160 1749	3.992	0.283 01 81	0.352 98
1.520	1.140 1537	4.175	0.267 551 8	0.377 382 9	1.570	1.160 5779	3.988	0.283 01 81	0.352 98
1.521	1.140 5709	4.171	0.267 551 8	0.377 382 9	1.571	1.160 9806	3.985	0.283 01 81	0.352 98
1.522	1.140 9893	4.167	0.267 551 8	0.377 382 9	1.572	1.161 3831	3.981	0.283 01 81	0.352 98
1.523	1.141 4011	4.163	0.267 551 8	0.377 382 9	1.573	1.161 7857	3.977	0.283 01 81	0.352 98
1.524	1.141 8125	4.159	0.267 551 8	0.377 382 9	1.574	1.162 1883	3.974	0.283 01 81	0.352 98
1.525	1.142 2263	4.156	0.267 551 8	0.377 382 9	1.575	1.162 5917	3.970	0.283 01 81	0.352 98
1.526	1.142 6310	4.152	0.267 551 8	0.377 382 9	1.576	1.162 9943	3.966	0.283 01 81	0.352 98
1.527	1.143 0360	4.148	0.267 551 8	0.377 382 9	1.577	1.163 3968	3.963	0.283 01 81	0.352 98
1.528	1.143 4412	4.144	0.267 551 8	0.377 382 9	1.578	1.163 7993	3.959	0.283 01 81	0.352 98
1.529	1.143 8461	4.141	0.267 551 8	0.377 382 9	1.579	1.164 1998	3.956	0.283 01 81	0.352 98
1.530	1.144 2493	4.137	0.267 551 8	0.377 382 9	1.580	1.164 5993	3.952	0.283 01 81	0.352 98
1.531	1.144 6528	4.133	0.267 551 8	0.377 382 9	1.581	1.164 9988	3.948	0.283 01 81	0.352 98
1.532	1.145 0569	4.129	0.267 551 8	0.377 382 9	1.582	1.165 3983	3.945	0.283 01 81	0.352 98
1.533	1.145 4610	4.125	0.267 551 8	0.377 382 9	1.583	1.165 7978	3.941	0.283 01 81	0.352 98
1.534	1.145 8610	4.122	0.267 551 8	0.377 382 9	1.584	1.166 1973	3.937	0.283 01 81	0.352 98
1.535	1.146 2720	4.118	0.267 551 8	0.377 382 9	1.585	1.166 5968	3.934	0.283 01 81	0.352 98
1.536	1.146 6790	4.114	0.267 551 8	0.377 382 9	1.586	1.166 9963	3.930	0.283 01 81	0.352 98
1.537	1.147 0858	4.110	0.267 551 8	0.377 382 9	1.587	1.167 3958	3.926	0.283 01 81	0.352 98
1.538	1.147 4927	4.107	0.267 551 8	0.377 382 9	1.588	1.167 7953	3.923	0.283 01 81	0.352 98
1.539	1.147 8972	4.103	0.267 551 8	0.377 382 9	1.589	1.168 1948	3.919	0.283 01 81	0.352 98
1.540	1.148 3023	4.099	0.267 551 8	0.377 382 9	1.590	1.168 5943	3.916	0.283 01 81	0.352 98
1.541	1.148 7079	4.095	0.267 551 8	0.377 382 9	1.591	1.168 9938	3.912	0.283 01 81	0.352 98
1.542	1.149 1131	4.092	0.267 551 8	0.377 382 9	1.592	1.169 3933	3.908	0.283 01 81	0.352 98
1.543	1.149 5183	4.088	0.267 551 8	0.377 382 9	1.593	1.169 7928	3.905	0.283 01 81	0.352 98
1.544	1.149 9230	4.085	0.267 551 8	0.377 382 9	1.594	1.170 1923	3.901	0.283 01 81	0.352 98
1.545	1.150 3281	4.081	0.267 551 8	0.377 382 9	1.595	1.170 5918	3.898	0.283 01 81	0.352 98
1.546	1.150 7331	4.077	0.267 551 8	0.377 382 9	1.596	1.170 9913	3.894	0.283 01 81	0.352 98
1.547	1.151 1381	4.073	0.267 551 8	0.377 382 9	1.597	1.171 3908	3.891	0.283 01 81	0.352 98
1.548	1.151 5431	4.069	0.267 551 8	0.377 382 9	1.598	1.171 7903	3.887	0.283 01 81	0.352 98
1.549	1.151 9481	4.066	0.267 551 8	0.377 382 9	1.599	1.172 1898	3.884	0.283 01 81	0.352 98
1.550	1.152 3532	4.062	0.267 551 8	0.377 382 9	1.600	1.172 5893	3.880	0.283 01 81	0.352 98
x	$2 \sinh^{-1} x = \frac{x}{\cosh x}$	$\operatorname{sech} x$	$2 \sinh^{-1} x = \frac{x}{\cosh x}$	$\operatorname{sech} x$	x	$2 \sinh^{-1} x = \frac{x}{\cosh x}$	$\operatorname{sech} x$	$2 \sinh^{-1} x = \frac{x}{\cosh x}$	$\operatorname{sech} x$

The Gudermannian.

n	gln	=F'	gln	=F'	n	gln	=F'	gln	=F'
1.600	1.172 3591	3880	69 10 46.38	70.03	1.650	1.104 3170	3701	68 55 26.27	70.41
.001	1.173 7472	3926	69 11 36.42	70.05	.001	1.105 7462	3748	68 56 41.41	70.41
.002	1.175 1139	3973	69 12 26.36	70.08	.002	1.107 1572	3795	68 57 56.55	70.42
.003	1.175 5472	4020	69 13 16.31	70.11	.003	1.108 4897	3842	68 59 11.69	70.42
.004	1.175 9581	4065	69 14 06.00	70.13	.004	1.109 7990	3889	68 59 31.83	70.42
1.605	1.174 2048	3912	69 16 55.60	70.16	1.655	1.103 1648	3682	68 51 47.67	70.05
.000	1.173 6868	3858	69 18 15.11	70.20	.001	1.104 5314	3731	68 53 03.04	70.08
.007	1.175 6666	3905	69 19 34.36	70.24	.007	1.104 9086	3780	68 54 18.28	70.09
.008	1.175 1548	3953	69 20 54.14	70.24	.008	1.104 8896	3827	68 54 38.52	70.10
.009	1.175 8897	4000	69 22 13.74	70.26	.009	1.104 1650	3874	68 54 58.76	70.12
1.610	1.176 2213	3851	69 23 33.07	70.29	1.660	1.105 0017	3920	68 56 07.40	70.16
.011	1.176 6099	3897	69 24 52.12	70.32	.010	1.105 3790	3967	68 56 27.64	70.18
.012	1.176 9895	3944	69 26 11.30	70.35	.012	1.105 7375	4014	68 56 48.00	70.20
.013	1.177 3730	3891	69 27 30.81	70.37	.013	1.106 1007	4061	68 57 08.00	70.20
.014	1.177 7592	3939	69 28 49.65	70.39	.014	1.106 4795	4108	68 57 28.53	70.23
1.615	1.178 1300	3836	69 30 68.61	70.43	1.665	1.106 8139	4153	68 57 49.03	70.26
.016	1.178 5215	3883	69 31 27.10	70.46	.016	1.107 2004	4200	68 58 09.28	70.29
.017	1.178 9090	3930	69 32 46.32	70.48	.017	1.107 5799	4247	68 58 29.40	70.32
.018	1.179 2953	3876	69 34 05.66	70.51	.018	1.107 9593	4294	68 58 49.66	70.35
.019	1.179 6807	3923	69 35 25.71	70.53	.019	1.108 3385	4341	68 59 09.77	70.38
1.620	1.180 0498	3869	69 36 45.31	70.56	1.670	1.108 6727	4386	68 59 29.80	70.40
.021	1.180 4345	3916	69 38 05.36	70.59	.021	1.109 0597	4433	68 59 49.77	70.43
.022	1.180 8189	3963	69 39 25.11	70.61	.022	1.109 4498	4480	68 59 69.55	70.46
.023	1.181 1890	4010	69 40 44.60	70.64	.023	1.109 8400	4527	68 59 89.50	70.48
.024	1.181 5645	4057	69 42 03.80	70.67	.024	1.110 2303	4574	68 59 10.24	70.52
1.625	1.181 9428	3901	69 43 23.21	70.69	1.675	1.109 6211	4619	68 59 30.03	70.55
.026	1.182 3188	3948	69 44 42.01	70.73	.026	1.110 0168	4666	68 59 49.55	70.58
.027	1.182 6951	3995	69 46 00.19	70.76	.027	1.110 4131	4713	68 59 68.90	70.61
.028	1.183 0716	4042	69 47 18.51	70.79	.028	1.110 8100	4760	68 59 88.57	70.64
.029	1.183 4491	4089	69 48 36.90	70.81	.029	1.111 2074	4807	68 59 10.00	70.67
1.630	1.183 8290	3924	69 49 55.33	70.83	1.680	1.110 6064	4852	68 59 29.25	70.70
.031	1.184 2092	3970	69 51 14.11	70.87	.031	1.111 0095	4899	68 59 48.28	70.73
.032	1.184 5901	4017	69 52 32.89	70.90	.032	1.111 4132	4946	68 59 67.08	70.76
.033	1.184 9699	4064	69 53 51.52	70.92	.033	1.111 8176	4993	68 59 86.00	70.79
.034	1.185 3497	4111	69 55 10.11	70.95	.034	1.112 2227	5040	68 59 105.00	70.82
1.635	1.185 7215	3959	69 56 28.62	70.98	1.685	1.111 6244	4985	68 59 17.07	70.86
.036	1.186 1030	4006	69 57 47.07	71.01	.036	1.112 0308	5032	68 59 36.40	70.89
.037	1.186 4839	4053	69 58 65.41	71.03	.037	1.112 4379	5079	68 59 55.70	70.92
.038	1.186 8649	4100	69 59 83.71	71.06	.038	1.112 8450	5126	68 59 75.00	70.95
.039	1.187 2443	4147	69 60 41.97	71.09	.039	1.113 2529	5173	68 59 13.25	70.98
1.640	1.187 6203	3993	69 62 00.12	71.12	1.690	1.112 6530	5219	68 59 32.00	71.01
.041	1.187 9999	4040	69 63 18.21	71.15	.041	1.113 0592	5266	68 59 50.90	71.04
.042	1.188 3781	4087	69 64 36.15	71.18	.042	1.113 4654	5313	68 59 69.50	71.07
.043	1.188 7555	4134	69 65 54.06	71.21	.043	1.113 8716	5360	68 59 88.13	71.11
.044	1.189 1329	4181	69 67 11.93	71.23	.044	1.114 2779	5407	68 59 106.80	71.14
1.645	1.189 5093	3982	69 68 30.33	71.26	1.695	1.113 6843	5352	68 59 11 34.11	71.27
.046	1.189 8865	4029	69 69 48.30	71.29	.046	1.114 0907	5399	68 59 12 47.11	71.30
.047	1.190 2631	4076	69 71 06.22	71.32	.047	1.114 4971	5446	68 59 14 00.11	71.33
.048	1.190 6394	4123	69 72 24.30	71.35	.048	1.114 9035	5493	68 59 15 13.11	71.37
.049	1.191 0160	4170	69 73 42.33	71.38	.049	1.115 3099	5540	68 59 16 26.11	71.40
1.650	1.191 3920	3991	69 75 00.76	71.41	1.700	1.114 7143	5587	68 59 17 39.60	71.43
u	2tan ⁻¹ u	u	2tan ⁻¹ u	u	2tan ⁻¹ u	u	2tan ⁻¹ u	u	2tan ⁻¹ u

BRITISH ANTHROPOLOGICAL SOCIETY

The Gudermannian.

u	$\operatorname{gd} u$	$\operatorname{erf} u$	$\operatorname{gd} u$	$\operatorname{erf} u$	u	$\operatorname{gd} u$	$\operatorname{erf} u$	$\operatorname{gd} u$	$\operatorname{erf} u$
1.700	1.209 4143	3536	69 17 39.60	72.03	1.750	1.226 6847	3374	70 17 01.89	69.39
1.701	1.209 7077	3532	69 18 52.50	72.86	1.751	1.227 0219	3370	70 18 11.44	69.52
1.702	1.210 1268	3529	69 20 05.32	72.70	1.752	1.227 3488	3367	70 19 20.03	69.65
1.703	1.210 4735	3525	69 21 18.08	72.72	1.753	1.227 6954	3364	70 20 30.35	69.80
1.704	1.210 8229	3522	69 22 30.77	72.66	1.754	1.228 0316	3361	70 21 39.71	69.92
1.705	1.211 1760	3519	69 23 43.20	72.59	1.755	1.228 3696	3358	70 22 49.00	69.26
1.706	1.211 5297	3516	69 24 55.05	72.52	1.756	1.228 7032	3355	70 23 58.23	69.10
1.707	1.211 8833	3513	69 26 06.43	72.45	1.757	1.229 0348	3351	70 25 07.39	69.13
1.708	1.212 2343	3509	69 27 21.85	72.38	1.758	1.229 3735	3348	70 26 16.48	69.06
1.709	1.212 5830	3506	69 28 33.20	72.32	1.759	1.229 7082	3345	70 27 25.51	69.00
1.710	1.212 9335	3503	69 29 45.49	72.25	1.760	1.230 0485	3342	70 28 34.48	68.93
1.711	1.213 2840	3499	69 30 57.70	72.18	1.761	1.230 3956	3339	70 29 43.38	68.87
1.712	1.213 6343	3496	69 32 09.85	72.11	1.762	1.230 7403	3336	70 30 52.22	68.80
1.713	1.213 9848	3493	69 33 21.93	72.05	1.763	1.231 0837	3333	70 32 01.00	68.74
1.714	1.214 3349	3490	69 34 33.94	71.98	1.764	1.231 3968	3330	70 33 09.69	68.69
1.715	1.214 6847	3486	69 35 45.80	71.91	1.765	1.231 7096	3326	70 34 18.33	68.61
1.716	1.215 0392	3483	69 36 57.70	71.84	1.766	1.232 0220	3323	70 35 26.91	68.54
1.717	1.215 3771	3480	69 38 09.57	71.78	1.767	1.232 3342	3320	70 36 35.42	68.48
1.718	1.215 7252	3477	69 39 21.32	71.71	1.768	1.232 6460	3317	70 37 43.87	68.42
1.719	1.216 0727	3473	69 40 32.99	71.64	1.769	1.232 9575	3314	70 38 52.25	68.35
1.720	1.216 4208	3470	69 41 44.60	71.58	1.770	1.233 2688	3311	70 40 00.57	68.29
1.721	1.216 7697	3467	69 42 56.14	71.51	1.771	1.233 5807	3307	70 41 08.83	68.22
1.722	1.217 1124	3464	69 44 07.62	71.44	1.772	1.233 8901	3304	70 42 17.02	68.16
1.723	1.217 4594	3460	69 45 19.02	71.37	1.773	1.234 2000	3301	70 43 25.14	68.09
1.724	1.217 8053	3457	69 46 30.37	71.31	1.774	1.234 5095	3298	70 44 33.18	68.03
1.725	1.218 1508	3454	69 47 41.61	71.23	1.775	1.234 8192	3295	70 45 41.20	67.96
1.726	1.218 4960	3451	69 48 52.85	71.16	1.776	1.235 1295	3292	70 46 49.17	67.90
1.727	1.218 8409	3447	69 50 03.99	71.10	1.777	1.235 4380	3289	70 47 57.00	67.84
1.728	1.219 1855	3444	69 51 15.06	71.03	1.778	1.235 7463	3286	70 49 04.80	67.77
1.729	1.219 5297	3441	69 52 26.06	70.96	1.779	1.236 0557	3283	70 50 12.54	67.71
1.730	1.219 8737	3438	69 53 37.00	70.90	1.780	1.236 3658	3280	70 51 20.22	67.64
1.731	1.220 2173	3434	69 54 47.88	70.83	1.781	1.236 6750	3276	70 52 27.85	67.58
1.732	1.220 5605	3431	69 55 58.68	70.76	1.782	1.236 9831	3273	70 53 35.38	67.52
1.733	1.220 9035	3428	69 57 09.42	70.70	1.783	1.237 2903	3270	70 54 42.87	67.45
1.734	1.221 2461	3425	69 58 20.10	70.63	1.784	1.237 5971	3267	70 55 50.29	67.39
1.735	1.221 5888	3422	69 59 30.71	70.56	1.785	1.237 9037	3264	70 56 57.66	67.33
1.736	1.221 9304	3418	69 60 41.25	70.50	1.786	1.238 2099	3261	70 58 04.94	67.26
1.737	1.222 2721	3415	69 61 51.72	70.43	1.787	1.238 5159	3258	70 59 12.17	67.20
1.738	1.222 6135	3412	69 63 02.13	70.37	1.788	1.238 8215	3255	71 00 19.34	67.13
1.739	1.222 9545	3409	69 64 12.47	70.30	1.789	1.239 1268	3252	71 01 26.44	67.07
1.740	1.223 2952	3405	69 65 22.75	70.23	1.790	1.239 4327	3249	71 02 33.48	67.01
1.741	1.223 6356	3402	69 66 32.96	70.18	1.791	1.240 0380	3246	71 03 40.46	66.94
1.742	1.223 9757	3399	69 67 43.10	70.11	1.792	1.240 3430	3243	71 04 47.37	66.88
1.743	1.224 3154	3396	69 68 53.18	70.05	1.793	1.240 6471	3240	71 05 54.22	66.82
1.744	1.224 6548	3393	69 70 03.19	70.00	1.794	1.241 0002	3236	71 07 01.01	66.76
1.745	1.224 9940	3390	69 71 13.14	69.91	1.795	1.241 3483	3233	71 08 07.73	66.69
1.746	1.225 3348	3387	69 72 23.02	69.85	1.796	1.241 6915	3230	71 09 14.39	66.63
1.747	1.225 6712	3383	69 73 32.84	69.78	1.797	1.242 0361	3227	71 10 20.90	66.57
1.748	1.226 0094	3380	69 74 42.50	69.72	1.798	1.242 3790	3224	71 11 27.32	66.50
1.749	1.226 3472	3377	69 75 52.27	69.65	1.799	1.242 8302	3221	71 12 33.99	66.44
1.750	1.226 6847	3374	69 77 01.89	69.59	1.800	1.243 1812	3218	71 13 40.40	66.38
u	$2 \tan^{-1}(e^u) - \frac{\pi}{2}$	$\operatorname{erf} u$	$2 \tan^{-1}(e^u) - 60^\circ$	$\operatorname{erf} u$	u	$2 \tan^{-1}(e^u) - \frac{\pi}{2}$	$\operatorname{erf} u$	$2 \tan^{-1}(e^u) - 60^\circ$	$\operatorname{erf} u$

u	gd u	uF'	gd u	uF'	u	gd u	uF'	gd u	uF'
1.800	1.243 1612	3218	71 13 40.40	66.36	1.850	1.258 8739	3069	72 07 41.78	63.30
.801	.243 6868	3215	71 14 40.75	66.31	.851	.259 18461	3066	72 08 45.05	63.24
.802	.243 8042	3212	71 15 53.03	66.25	.852	.259 4890	3063	72 09 48.26	63.18
.803	.244 1252	3209	71 16 59.25	66.19	.853	.259 7952	3060	72 10 51.41	63.12
.804	.244 4460	3206	71 18 05.41	66.13	.854	.260 1011	3057	72 11 54.50	63.06
1.805	1.244 7664	3203	71 19 11.59	66.06	1.855	1.260 4066	3054	72 12 57.53	63.00
.806	.245 0895	3200	71 20 17.53	66.00	.856	.260 7119	3051	72 14 00.50	62.94
.807	.245 4064	3197	71 21 23.30	65.94	.857	.261 0169	3048	72 15 03.41	62.88
.808	.245 7239	3194	71 22 29.41	65.88	.858	.261 3216	3045	72 16 06.26	62.82
.809	.246 0451	3191	71 23 35.26	65.81	.859	.261 6260	3043	72 17 09.05	62.76
1.810	1.246 3640	3188	71 24 41.04	65.75	1.860	1.261 9302	3040	72 18 11.78	62.70
.811	.246 6827	3185	71 25 46.76	65.69	.861	.262 2349	3037	72 19 14.45	62.64
.812	.247 0010	3182	71 26 52.42	65.63	.862	.262 5375	3034	72 20 17.06	62.58
.813	.247 3190	3179	71 27 58.01	65.56	.863	.262 8408	3031	72 21 19.61	62.52
.814	.247 6367	3176	71 29 03.54	65.50	.864	.263 1438	3028	72 22 22.10	62.46
1.815	1.247 9541	3173	71 30 09.02	65.44	1.865	1.263 4461	3025	72 23 24.51	62.40
.816	.248 2712	3170	71 31 14.42	65.38	.866	.263 7488	3022	72 24 26.91	62.34
.817	.248 5880	3167	71 32 19.77	65.32	.867	.264 0509	3020	72 25 29.23	62.28
.818	.248 9045	3164	71 33 25.06	65.25	.868	.264 3527	3017	72 26 31.47	62.22
.819	.249 2208	3161	71 34 30.28	65.19	.869	.264 6543	3014	72 27 33.67	62.16
1.820	1.249 5367	3158	71 35 35.44	65.13	1.870	1.264 9555	3011	72 28 35.80	62.11
.821	.249 8523	3155	71 36 40.54	65.07	.871	.265 2565	3008	72 29 37.88	62.05
.822	.250 1676	3152	71 37 45.58	65.01	.872	.265 5571	3005	72 30 39.90	61.99
.823	.250 4826	3149	71 38 50.56	64.95	.873	.265 8575	3002	72 31 41.85	61.93
.824	.250 7973	3146	71 39 55.47	64.88	.874	.266 1576	2999	72 32 43.75	61.87
1.825	1.251 1118	3143	71 41 00.32	64.82	1.875	1.266 4574	2997	72 33 45.59	61.81
.826	.251 4230	3140	71 42 05.11	64.76	.876	.266 7569	2994	72 34 47.37	61.75
.827	.251 7327	3137	71 43 09.84	64.70	.877	.267 0562	2991	72 35 49.09	61.69
.828	.252 0512	3134	71 44 14.51	64.64	.878	.267 3551	2988	72 36 50.75	61.63
.829	.252 3694	3131	71 45 19.12	64.58	.879	.267 6538	2985	72 37 52.36	61.57
1.830	1.252 6794	3128	71 46 23.67	64.52	1.880	1.267 9521	2982	72 38 53.90	61.52
.831	.252 9909	3125	71 47 28.15	64.45	.881	.268 2502	2980	72 39 55.29	61.46
.832	.253 3043	3122	71 48 32.57	64.39	.882	.268 5480	2977	72 40 56.82	61.40
.833	.253 6164	3119	71 49 36.94	64.33	.883	.268 8456	2974	72 41 58.19	61.34
.834	.253 9281	3116	71 50 41.24	64.27	.884	.269 1428	2971	72 42 59.30	61.28
1.835	1.254 2395	3113	71 51 45.48	64.21	1.885	1.269 4398	2968	72 43 00.75	61.22
.836	.254 5507	3110	71 52 49.66	64.15	.886	.269 7364	2965	72 44 01.94	61.16
.837	.254 8616	3107	71 53 53.77	64.09	.887	.270 0328	2962	72 45 03.08	61.11
.838	.255 1721	3104	71 54 57.83	64.03	.888	.270 3289	2960	72 46 04.15	61.05
.839	.255 4824	3101	71 56 01.83	63.97	.889	.270 6248	2957	72 47 05.17	60.99
1.840	1.255 7923	3098	71 57 05.76	63.91	1.890	1.270 9203	2954	72 48 06.13	60.93
.841	.256 1020	3095	71 58 09.64	63.84	.891	.271 2156	2951	72 49 07.03	60.87
.842	.256 4114	3092	71 59 13.45	63.78	.892	.271 5106	2948	72 50 07.88	60.81
.843	.256 7205	3089	72 00 17.21	63.72	.893	.271 8053	2946	72 51 08.66	60.76
.844	.257 0293	3086	72 01 20.90	63.66	.894	.272 0997	2943	72 52 09.39	60.70
1.845	1.257 3378	3083	72 02 24.53	63.60	1.895	1.272 3938	2940	72 53 10.06	60.64
.846	.257 6460	3080	72 03 28.10	63.54	.896	.272 6877	2937	72 54 10.67	60.58
.847	.257 9539	3077	72 04 31.61	63.48	.897	.272 9812	2934	72 55 11.23	60.52
.848	.258 2615	3074	72 05 35.06	63.42	.898	.273 2745	2932	72 56 11.72	60.47
.849	.258 5688	3072	72 06 38.45	63.36	.899	.273 5675	2929	72 57 12.16	60.41
1.850	1.258 8739	3069	72 07 41.78	63.30	1.900	1.273 8601	2926	72 58 12.54	60.35
u	$2 \tan^{-1}(e^u) - \frac{\pi}{2}$	$\coth u$	$2 \tan^{-1}(e^u) - 90^\circ$	$\coth u$	u	$2 \tan^{-1}(e^u) - \frac{\pi}{2}$	$\coth u$	$2 \tan^{-1}(e^u) - 90^\circ$	$\coth u$

The Gudermannian.

x	$\sin x$	$\cos x$	$\tan x$	$\cot x$	x	$\sin x$	$\cos x$	$\tan x$	$\cot x$
1.000	1.273 8903	29.21	73 59 12.54	60.35	1.050	1.288 1451	2789	73 48 19.01	57.53
.001	.251 15.7	29.21	73 59 12.80	60.29	.051	.288 1439	2785	73 49 16.51	57.47
.002	.274 14.99	29.20	73 59 13.13	60.24	.052	.288 2024	2784	73 50 13.95	57.42
.003	.251 7.98	29.18	73 53 13.33	60.18	.053	.288 9805	2781	73 51 11.34	57.36
.004	.275 6.81	29.15	73 53 13.46	60.12	.054	.289 2586	2778	73 52 08.68	57.31
1.005	1.275 3917	29.12	73 54 13.58	60.06	1.055	1.289 5363	2776	73 53 05.05	57.25
.006	.275 1008	29.09	73 55 13.61	60.01	.056	.289 8137	2773	73 54 02.18	57.20
.007	.275 0016	29.06	73 56 13.50	59.95	.057	.290 0909	2770	73 55 00.35	57.14
.008	.276 10.11	29.01	73 57 13.51	59.89	.058	.290 3678	2768	73 55 57.46	57.09
.009	.276 48.13	29.01	73 58 13.37	59.81	.059	.290 6444	2765	73 56 54.52	57.03
1.010	1.276 7712	28.98	73 59 13.18	59.78	1.060	1.290 9208	2762	73 57 51.53	56.98
.011	.277 0609	28.95	73 10 12.92	59.74	.061	.291 1969	2760	73 58 48.48	56.92
.012	.277 3513	28.93	73 11 12.62	59.66	.062	.291 4727	2757	73 59 45.38	56.87
.013	.277 6391	28.90	73 12 12.25	59.61	.063	.291 7481	2754	74 00 42.22	56.81
.014	.277 9232	28.87	73 13 11.83	59.55	.064	.292 0236	2752	74 01 39.00	56.76
1.015	1.278 2128	28.84	73 14 11.35	59.49	1.065	1.292 2987	2749	74 02 35.73	56.70
.016	.278 5001	28.81	73 15 10.81	59.43	.066	.292 5734	2746	74 03 32.41	56.65
.017	.278 7843	28.79	73 16 10.22	59.38	.067	.292 8480	2744	74 04 29.03	56.60
.018	.279 0688	28.76	73 17 09.59	59.32	.068	.293 1222	2741	74 05 25.60	56.54
.019	.279 3543	28.73	73 18 08.80	59.26	.069	.293 3962	2739	74 06 22.12	56.49
1.020	1.279 6515	28.70	73 19 08.00	59.21	1.070	1.293 6699	2736	74 07 18.58	56.43
.021	.279 9411	28.68	73 20 07.27	59.15	.071	.293 9433	2733	74 08 15.08	56.38
.022	.280 2300	28.65	73 21 06.49	59.09	.072	.294 2166	2731	74 09 11.53	56.32
.023	.280 5191	28.62	73 22 05.66	59.04	.073	.294 4898	2728	74 10 07.93	56.27
.024	.280 8083	28.59	73 23 04.77	58.98	.074	.294 7629	2725	74 11 04.37	56.22
1.025	1.281 0881	28.57	73 24 03.82	58.93	1.075	1.295 0356	2722	74 12 00.86	56.16
.026	.281 3738	28.54	73 25 02.82	58.87	.076	.295 3088	2720	74 12 56.30	56.11
.027	.281 6590	28.51	73 26 01.76	58.81	.077	.295 5801	2718	74 13 51.88	56.05
.028	.281 9440	28.49	73 26 59.51	58.76	.078	.295 8503	2715	74 14 48.39	56.00
.029	.282 2288	28.46	73 27 58.07	58.70	.079	.296 1200	2712	74 15 44.88	55.95
1.030	1.282 5132	28.43	73 28 57.31	58.64	1.080	1.296 3927	2710	74 16 40.36	55.89
.031	.282 7974	28.40	73 29 55.98	58.59	.081	.296 6650	2707	74 17 36.06	55.84
.032	.283 0813	28.38	73 30 54.51	58.53	.082	.296 9362	2705	74 18 31.87	55.78
.033	.283 3650	28.35	73 31 53.01	58.47	.083	.297 2065	2702	74 19 27.68	55.73
.034	.283 6493	28.32	73 32 51.46	58.41	.084	.297 4765	2699	74 20 23.34	55.68
1.035	1.283 9333	28.29	73 33 49.85	58.36	1.085	1.297 7463	2697	74 21 18.90	55.62
.036	.284 2171	28.27	73 34 48.18	58.31	.086	.298 0159	2694	74 22 14.58	55.57
.037	.284 5007	28.24	73 35 46.46	58.25	.087	.298 2852	2692	74 23 10.13	55.52
.038	.284 7839	28.21	73 36 44.68	58.19	.088	.298 5542	2689	74 24 05.68	55.46
.039	.285 0669	28.19	73 37 42.85	58.14	.089	.298 8230	2686	74 25 01.25	55.41
1.040	1.285 3527	28.16	73 38 40.96	58.08	1.090	1.299 0925	2684	74 25 56.41	55.36
.041	.285 6361	28.13	73 39 39.01	58.03	.091	.299 3617	2681	74 26 51.77	55.30
.042	.285 9193	28.11	73 40 37.01	57.97	.092	.299 6307	2679	74 27 47.04	55.25
.043	.286 1992	28.08	73 41 34.95	57.92	.093	.299 8994	2676	74 28 42.27	55.20
.044	.286 4789	28.05	73 42 32.84	57.86	.094	.300 1679	2673	74 29 37.44	55.14
1.045	1.286 7673	28.02	73 43 30.68	57.80	1.095	1.300 4361	2671	74 30 32.55	55.09
.046	.287 0471	28.00	73 44 28.45	57.75	.096	.300 7051	2668	74 31 27.68	55.04
.047	.287 3267	27.97	73 45 26.17	57.69	.097	.300 9738	2666	74 32 22.65	54.98
.048	.287 6058	27.94	73 46 23.84	57.64	.098	.301 2422	2663	74 33 17.50	54.93
.049	.287 8844	27.92	73 47 21.45	57.58	.099	.301 5104	2661	74 34 12.40	54.88
1.050	1.288 1451	27.89	73 48 19.01	57.53	1.100	1.301 7693	2658	74 35 07.34	54.83
x	$2 \sin^{-1}(\sin x)$	$\frac{\pi}{2}$	$2 \sin^{-1}(\cos x)$	$\frac{\pi}{2}$	x	$2 \sin^{-1}(\sin x)$	$\frac{\pi}{2}$	$2 \sin^{-1}(\cos x)$	$\frac{\pi}{2}$

The Gudermannian.

u	gd u	uF ₂	gd u	uF ₂	u	gd u	uF ₂	gd u	uF ₂
2.000	1.301 7603	2658	74 35 07.34	54.83	2.050	1.314 7340	2533	75 19 43.53	52.24
.001	.302 0250	2653	74 36 02.14	54.77	.051	.314 9880	2530	75 20 35.75	52.10
.002	.302 2914	2653	74 36 56.80	54.72	.052	.315 2400	2528	75 21 27.91	52.04
.003	.302 5566	2648	74 37 51.58	54.67	.053	.315 4936	2525	75 22 20.03	52.00
.004	.302 8215	2648	74 38 46.33	54.61	.054	.315 7460	2523	75 23 12.09	52.04
2.005	1.303 0861	2645	74 39 40.81	54.56	2.055	1.315 9982	2520	75 24 04.11	51.90
.006	.303 3505	2643	74 40 35.35	54.51	.056	.316 2501	2518	75 24 56.07	51.94
.007	.303 6147	2640	74 41 29.83	54.46	.057	.316 5018	2516	75 25 47.98	51.89
.008	.303 8786	2638	74 42 24.26	54.40	.058	.316 7532	2513	75 26 39.85	51.84
.009	.304 1422	2635	74 43 18.64	54.35	.059	.317 0044	2511	75 27 31.66	51.79
2.010	1.304 4056	2633	74 44 12.97	54.30	2.060	1.317 2554	2508	75 28 23.42	51.74
.011	.304 6687	2630	74 45 07.44	54.25	.061	.317 5061	2506	75 29 15.14	51.60
.012	.304 9310	2627	74 46 01.95	54.19	.062	.317 7566	2503	75 30 06.80	51.64
.013	.305 1942	2625	74 46 55.63	54.14	.063	.318 0068	2501	75 30 58.41	51.59
.014	.305 4566	2622	74 47 49.74	54.09	.064	.318 2568	2499	75 31 49.98	51.54
2.015	1.305 7187	2620	74 48 43.81	54.04	2.065	1.318 5065	2496	75 32 41.49	51.49
.016	.305 9805	2617	74 49 37.82	53.99	.066	.318 7560	2494	75 33 32.95	51.44
.017	.306 2421	2615	74 50 31.78	53.93	.067	.319 0053	2491	75 34 24.37	51.39
.018	.306 5035	2612	74 51 25.60	53.88	.068	.319 2543	2489	75 35 15.73	51.34
.019	.306 7646	2610	74 52 19.34	53.83	.069	.319 5031	2487	75 36 07.04	51.29
2.020	1.307 0254	2607	74 53 13.35	53.78	2.070	1.319 7516	2484	75 36 58.31	51.24
.021	.307 2860	2605	74 54 07.10	53.73	.071	.319 9999	2482	75 37 49.52	51.19
.022	.307 5464	2602	74 55 00.80	53.67	.072	.320 2480	2479	75 38 40.69	51.14
.023	.307 8065	2600	74 55 54.45	53.62	.073	.320 4958	2477	75 39 31.80	51.09
.024	.308 0663	2597	74 56 48.05	53.57	.074	.320 7433	2475	75 40 22.87	51.04
2.025	1.308 3269	2595	74 57 41.39	53.52	2.075	1.320 9907	2472	75 41 13.89	50.99
.026	.308 5853	2593	74 58 35.08	53.47	.076	.321 2378	2470	75 42 04.85	50.94
.027	.308 8443	2590	74 59 28.52	53.42	.077	.321 4846	2467	75 42 55.77	50.89
.028	.309 1032	2587	75 00 21.91	53.36	.078	.321 7312	2465	75 43 46.64	50.84
.029	.309 3618	2585	75 01 15.25	53.31	.079	.321 9776	2463	75 44 37.46	50.79
2.030	1.309 6201	2582	75 02 08.54	53.26	2.080	1.322 2238	2460	75 45 28.23	50.75
.031	.309 8782	2580	75 03 01.78	53.21	.081	.322 4707	2458	75 46 18.95	50.70
.032	.310 1361	2577	75 03 54.96	53.16	.082	.322 7153	2455	75 47 09.62	50.65
.033	.310 3936	2575	75 04 48.09	53.11	.083	.322 9608	2453	75 48 00.24	50.60
.034	.310 6510	2572	75 05 41.17	53.06	.084	.323 2060	2451	75 48 50.82	50.55
2.035	1.310 9081	2570	75 06 34.20	53.00	2.085	1.323 4509	2448	75 49 41.34	50.50
.036	.311 1659	2567	75 07 27.18	52.95	.086	.323 6956	2446	75 50 31.82	50.45
.037	.311 4215	2565	75 08 20.11	52.90	.087	.323 9401	2444	75 51 22.25	50.40
.038	.311 6779	2562	75 09 12.99	52.85	.088	.324 1843	2441	75 52 12.62	50.35
.039	.311 9340	2560	75 10 05.81	52.80	.089	.324 4283	2439	75 53 02.95	50.30
2.040	1.312 1898	2557	75 10 58.30	52.75	2.090	1.324 6721	2436	75 53 53.23	50.26
.041	.312 4455	2555	75 11 50.31	52.70	.091	.324 9156	2434	75 54 43.46	50.21
.042	.312 7008	2552	75 12 42.98	52.65	.092	.325 1589	2432	75 55 33.65	50.16
.043	.312 9559	2550	75 13 35.00	52.60	.093	.325 4020	2429	75 56 23.78	50.11
.044	.313 2108	2547	75 14 26.17	52.55	.094	.325 6448	2427	75 57 13.86	50.06
2.045	1.313 4654	2545	75 15 17.69	52.49	2.095	1.325 8874	2425	75 58 03.90	50.01
.046	.313 7198	2543	75 16 10.15	52.44	.096	.326 1297	2422	75 58 53.89	49.96
.047	.313 9737	2540	75 17 02.36	52.39	.097	.326 3718	2420	75 59 43.83	49.91
.048	.314 2272	2538	75 17 54.95	52.34	.098	.326 6137	2418	76 00 33.72	49.87
.049	.314 4815	2535	75 18 47.27	52.29	.099	.326 8554	2415	76 01 23.56	49.82
2.050	1.314 7340	2533	75 19 43.53	52.24	2.100	1.327 0968	2413	76 02 13.36	49.77
u	$2 \tan^{-1}(e^u) - \frac{\pi}{2}$	weech u	$2 \tan^{-1}(e^u) - 90^\circ$	weech u	u	$2 \tan^{-1}(e^u) - \frac{\pi}{2}$	weech u	$2 \tan^{-1}(e^u) - 90^\circ$	weech u

SMITHSONIAN TABLES

The Gudermannian.

u	$\sin u$	$\cos u$	$\sin u$	$\cos u$	u	$\sin u$	$\cos u$	$\sin u$	$\cos u$
2.100	1.327 0638	2.103	75 03 13.36	49.77	2.190	1.338 8738	2.208	76 42 42.42	47.41
.101	.327 1680	2.111	75 03 03.11	49.72	.191	.339 1020	2.205	76 43 20.81	47.35
.102	.327 2720	2.108	75 03 52.80	49.67	.192	.339 3325	2.204	76 41 17.15	47.32
.103	.327 3760	2.106	75 04 42.45	49.63	.193	.339 5617	2.202	76 43 04.44	47.27
.104	.328 0001	2.104	75 05 32.00	49.58	.194	.339 7908	2.200	76 45 51.69	47.23
2.105	1.328 3004	2.101	75 06 21.61	49.53	2.195	1.340 0197	2.207	76 46 38.80	47.18
.106	.328 5103	2.109	75 07 11.11	49.48	.196	.340 2483	2.205	76 47 26.06	47.13
.107	.328 7081	2.107	75 08 00.57	49.43	.197	.340 4769	2.203	76 48 13.16	47.09
.108	.329 0107	2.104	75 08 40.08	49.39	.198	.340 7049	2.201	76 49 00.23	47.04
.109	.329 2500	2.102	75 09 30.11	49.34	.199	.340 9328	2.208	76 49 47.25	47.00
2.110	1.329 4980	2.100	75 10 20.65	49.29	2.160	1.341 1605	2.205	76 50 34.22	46.95
.111	.329 7369	2.107	75 11 17.02	49.24	.161	.341 3881	2.204	76 51 21.15	46.90
.112	.329 9755	2.105	75 12 07.12	49.19	.162	.341 6153	2.202	76 52 08.03	46.86
.113	.330 2139	2.103	75 12 56.31	49.15	.163	.341 8421	2.200	76 52 54.87	46.81
.114	.330 4520	2.100	75 13 45.43	49.10	.164	.342 0693	2.207	76 53 41.66	46.77
2.115	1.330 6900	2.108	75 14 34.51	49.05	2.165	1.342 2950	2.205	76 54 28.40	46.72
.116	.330 9277	2.106	75 15 23.34	49.00	.166	.342 5203	2.203	76 55 15.10	46.68
.117	.331 1651	2.103	75 16 12.52	48.96	.167	.342 7458	2.201	76 56 01.76	46.63
.118	.331 4023	2.101	75 17 01.45	48.91	.168	.342 9714	2.209	76 56 48.16	46.59
.119	.331 6393	2.109	75 17 50.33	48.86	.169	.343 1962	2.206	76 57 34.03	46.54
2.120	1.331 8761	2.107	75 18 39.47	48.81	2.170	1.343 4237	2.204	76 58 21.45	46.50
.121	.332 1147	2.104	75 19 29.09	48.77	.171	.343 6510	2.202	76 59 09.04	46.45
.122	.332 3520	2.102	75 20 18.20	48.72	.172	.343 8781	2.200	76 59 51.38	46.41
.123	.332 5890	2.100	75 21 05.40	48.67	.173	.344 1049	2.208	77 00 38.73	46.36
.124	.332 8259	2.108	75 21 51.04	48.62	.174	.344 3320	2.205	77 01 27.07	46.31
2.125	1.333 0636	2.105	75 22 42.04	48.58	2.175	1.344 5594	2.203	77 02 13.36	46.27
.126	.333 2999	2.103	75 23 31.20	48.53	.176	.344 7743	2.201	77 02 59.61	46.22
.127	.333 5351	2.100	75 24 19.20	48.48	.177	.344 9893	2.209	77 03 45.81	46.18
.128	.333 7702	2.108	75 25 08.16	48.44	.178	.345 2020	2.207	77 04 31.96	46.13
.129	.334 0050	2.106	75 25 56.57	48.39	.179	.345 4155	2.204	77 05 18.08	46.09
2.130	1.334 2415	2.103	75 26 44.91	48.34	2.180	1.345 6300	2.202	77 06 04.14	46.04
.131	.334 4761	2.101	75 27 33.30	48.29	.181	.345 8441	2.200	77 06 50.17	46.00
.132	.334 7105	2.109	75 28 21.53	48.25	.182	.346 0580	2.208	77 07 36.14	45.95
.133	.334 9443	2.107	75 29 09.75	48.20	.183	.346 2717	2.206	77 08 22.08	45.91
.134	.335 1788	2.104	75 29 57.93	48.15	.184	.346 4850	2.204	77 09 07.96	45.87
2.135	1.335 4162	2.102	75 30 46.06	48.11	2.185	1.346 6981	2.202	77 09 53.81	45.82
.136	.335 6533	2.100	75 31 34.14	48.06	.186	.346 9114	2.200	77 10 39.60	45.78
.137	.335 8902	2.108	75 32 22.48	48.01	.187	.347 1242	2.208	77 11 25.36	45.73
.138	.336 1268	2.106	75 33 10.17	47.97	.188	.347 3377	2.206	77 12 11.07	45.69
.139	.336 3633	2.103	75 33 58.11	47.92	.189	.347 5509	2.204	77 12 56.75	45.64
2.140	1.336 6035	2.101	75 34 46.01	47.87	2.190	1.347 7631	2.202	77 13 42.35	45.60
.141	.336 8455	2.109	75 35 33.89	47.83	.191	.348 9754	2.200	77 14 27.93	45.55
.142	.337 0872	2.107	75 36 21.66	47.78	.192	.349 1878	2.208	77 15 13.46	45.51
.143	.337 3288	2.104	75 37 09.44	47.73	.193	.349 3998	2.206	77 15 58.95	45.46
.144	.337 5701	2.102	75 37 57.13	47.69	.194	.349 6113	2.204	77 16 44.39	45.42
2.145	1.337 8142	2.100	75 38 44.79	47.64	2.195	1.349 8220	2.202	77 17 29.79	45.38
.146	.338 0520	2.108	75 39 32.41	47.59	.196	.349 0325	2.200	77 18 15.14	45.33
.147	.338 2896	2.106	75 40 19.98	47.55	.197	.349 2425	2.208	77 19 00.45	45.29
.148	.338 5271	2.103	75 41 07.51	47.50	.198	.349 4520	2.206	77 19 45.72	45.24
.149	.338 7642	2.101	75 41 54.99	47.46	.199	.349 6613	2.204	77 20 30.94	45.20
2.150	1.338 8732	2.208	76 42 42.42	47.41	2.200	1.350 0903	2.189	77 21 16.11	45.16
u	$2 \tan^{-1}(\frac{e^u - 1}{e^u + 1})$	$\operatorname{sech} u$	$2 \tan^{-1}(\frac{e^u - 1}{e^u + 1}) - 90^\circ$	$\operatorname{sech} u$	u	$2 \tan^{-1}(\frac{e^u - 1}{e^u + 1})$	$\operatorname{sech} u$	$2 \tan^{-1}(\frac{e^u - 1}{e^u + 1}) - 90^\circ$	$\operatorname{sech} u$

The Godefrmannian.

u	g d n	u f d	g d n	u f d	u	g d n	u f d	g d n	u f d
2.200	1.350 0000	2180	77 21 16.11	45.10	2.250	1.360 77.11	2185	77 57 59.04	43.00
.201	.350 3001	2187	77 22 01.25	45.11	.251	.360 0817	2191	77 58 14.10	42.99
.202	.350 5127	2188	77 22 16.31	45.07	.252	.360 1800	2192	77 59 25.20	42.92
.203	.350 7301	2189	77 22 31.38	45.03	.253	.360 3628	2193	78 00 16.26	42.88
.204	.350 9543	2181	77 21 16.38	41.98	.254	.360 6090	2197	78 00 51.32	42.83
2.205	1.351 1821	2170	77 25 01.31	41.91	2.255	1.361 31.12	2195	78 01 31.31	42.79
.206	.351 1000	2175	77 25 16.35	41.84	.256	.361 6205	2193	78 02 16.00	42.75
.207	.351 6175	2171	77 26 11.12	41.88	.257	.361 2.77	2191	78 02 50.01	42.71
.208	.351 8348	2173	77 27 15.05	41.80	.258	.361 1317	2190	78 03 15.37	42.67
.209	.352 0519	2170	77 28 00.23	41.70	.259	.362 6114	2187	78 01 31.07	42.63
2.210	1.352 2681	2168	77 28 15.47	41.73	2.260	1.362 8680	2185	78 02 07.57	42.58
.211	.352 4855	2166	77 29 30.10	41.67	.261	.361 05.11	2183	78 03 50.11	42.54
.212	.352 7030	2164	77 30 13.32	41.63	.262	.361 2005	2180	78 04 35.00	42.50
.213	.352 9183	2162	77 30 50.42	41.60	.263	.361 4001	2178	78 07 15.11	42.46
.214	.353 1313	2159	77 31 13.00	41.51	.264	.361 67.23	2175	78 07 57.57	42.42
2.215	1.353 3861	2157	77 32 28.51	41.50	2.265	1.361 13.77	2184	78 08 30.07	42.38
.216	.353 5968	2155	77 33 13.00	41.40	.266	.361 1811	2182	78 09 25.11	42.34
.217	.353 8012	2153	77 33 59.12	41.41	.267	.361 2886	2180	78 10 01.01	42.30
.218	.353 9961	2151	77 34 11.31	41.37	.268	.361 40.11	2178	78 10 50.00	42.26
.219	.354 2114	2149	77 35 26.16	41.33	.269	.361 60.09	2176	78 11 30.11	42.21
2.220	1.354 4352	2147	77 36 00.46	41.38	2.270	1.361 60.01	2174	78 12 11.11	42.17
.221	.354 6568	2145	77 36 53.73	41.31	.271	.362 00.68	2172	78 12 53.68	42.14
.222	.354 8855	2143	77 37 38.04	41.30	.272	.362 1100	2170	78 13 35.00	42.09
.223	.355 0901	2141	77 38 21.11	41.15	.273	.362 31.10	2168	78 14 17.00	42.05
.224	.355 2833	2138	77 39 07.41	41.11	.274	.362 71.00	2166	78 14 59.00	42.00
2.225	1.355 5070	2136	77 39 51.13	41.07	2.275	1.362 62.01	2164	78 15 41.00	41.96
.226	.355 7166	2134	77 40 35.48	41.02	.276	.362 12.03	2162	78 16 23.03	41.92
.227	.355 9230	2132	77 41 10.48	41.00	.277	.362 42.06	2160	78 17 05.01	41.88
.228	.356 1370	2130	77 42 01.11	41.01	.278	.362 51.06	2158	78 17 47.17	41.84
.229	.356 3109	2128	77 42 42.45	41.00	.279	.362 73.11	2156	78 18 29.10	41.80
2.230	1.356 5566	2126	77 43 31.11	41.85	2.280	1.362 63.00	2154	78 19 10.07	41.76
.231	.356 7751	2124	77 44 11.00	41.81	.281	.362 13.02	2152	78 19 52.71	41.72
.232	.356 9874	2122	77 44 56.24	41.77	.282	.362 31.11	2150	78 20 33.00	41.68
.233	.357 2005	2120	77 45 41.49	41.73	.283	.362 51.11	2148	78 21 16.00	41.64
.234	.357 4114	2118	77 46 26.10	41.68	.284	.362 74.51	2147	78 21 57.51	41.60
2.235	1.357 6130	2116	77 47 09.35	41.61	2.285	1.362 61.06	2145	78 22 30.25	41.55
.236	.357 8315	2114	77 47 53.47	41.60	.286	.362 14.00	2143	78 23 00.00	41.51
.237	.358 0357	2111	77 48 37.04	41.55	.287	.362 31.02	2141	78 23 00.23	41.47
.238	.358 2368	2109	77 49 20.57	41.51	.288	.362 53.01	2139	78 24 13.21	41.43
.239	.358 4076	2107	77 50 04.00	41.47	.289	.362 73.00	2137	78 25 05.11	41.39
2.240	1.358 6981	2105	77 50 47.51	41.43	2.290	1.362 63.15	2135	78 26 06.51	41.35
.241	.358 8887	2103	77 51 30.01	41.38	.291	.362 13.10	2133	78 26 47.10	41.31
.242	.359 0689	2101	77 52 14.17	41.34	.292	.362 35.21	2131	78 27 28.11	41.27
.243	.359 3081	2099	77 52 57.50	41.30	.293	.362 55.30	2129	78 28 10.10	41.23
.244	.359 5107	2097	77 53 40.37	41.26	.294	.362 75.18	2127	78 28 51.00	41.19
2.245	1.359 7373	2095	77 51 23.10	41.21	2.295	1.362 63.11	2125	78 29 32.77	41.15
.246	.359 9377	2093	77 52 07.20	41.17	.296	.362 13.03	2123	78 30 13.00	41.11
.247	.360 1470	2091	77 52 50.41	41.11	.297	.362 35.00	2121	78 30 53.01	41.07
.248	.360 3559	2089	77 53 33.55	41.00	.298	.362 54.00	2119	78 31 36.00	41.03
.249	.360 5947	2087	77 54 16.62	41.01	.299	.362 74.70	2117	78 32 17.01	40.99
2.250	1.360 7733	2085	77 57 59.61	41.00	2.300	1.370 10.05	2115	78 32 58.01	40.95
u	21m 44m $\frac{u}{2}$	weeks	21m 44m 00"	weeks	u	21m 44m $\frac{u}{2}$	weeks	21m 44m 00"	weeks

The Godermannian.

α	$\sin \alpha$	$\cos \alpha$	$\tan \alpha$	$\cot \alpha$	α	$\sin \alpha$	$\cos \alpha$	$\tan \alpha$	$\cot \alpha$
2.390	1.370 9465	1685	28 32 58.01	40.95	2.390	1.370 6331	1800	79 06 55.03	38.00
2.391	1.371 1419	1684	28 33 38.04	40.91	2.391	1.370 8221	1888	79 06 55.00	38.05
2.392	1.371 3444	1683	28 34 19.82	40.87	2.392	1.371 0168	1880	79 07 33.93	38.04
2.393	1.371 5444	1682	28 35 00.67	40.83	2.393	1.371 1994	1886	79 08 12.82	38.87
2.394	1.371 7490	1687	28 35 41.38	40.79	2.394	1.371 3877	1885	79 08 51.67	38.84
2.395	1.371 9567	1695	28 36 22.25	40.75	2.395	1.371 5790	1881	79 09 30.49	38.80
2.396	1.372 1641	1694	28 37 02.98	40.71	2.396	1.371 7630	1879	79 10 09.27	38.76
2.397	1.372 3713	1692	28 37 43.66	40.66	2.397	1.371 9517	1877	79 10 48.01	38.72
2.398	1.372 5783	1690	28 38 24.31	40.63	2.398	1.372 1391	1875	79 11 26.71	38.68
2.399	1.372 7853	1698	28 39 04.92	40.59	2.399	1.372 3268	1874	79 12 05.37	38.64
2.400	1.372 9920	1696	28 39 45.49	40.55	2.400	1.372 5141	1872	79 12 44.00	38.61
2.401	1.373 1985	1694	28 40 26.02	40.51	2.401	1.372 7012	1870	79 13 22.59	38.57
2.402	1.373 4048	1692	28 41 06.51	40.47	2.402	1.372 8881	1868	79 14 01.14	38.53
2.403	1.373 6109	1690	28 41 46.95	40.43	2.403	1.373 0748	1866	79 14 39.55	38.49
2.404	1.373 8168	1698	28 42 27.37	40.39	2.404	1.373 2613	1864	79 15 18.12	38.46
2.405	1.374 0225	1696	28 43 07.74	40.35	2.405	1.373 4476	1863	79 15 56.56	38.42
2.406	1.374 2280	1694	28 43 48.09	40.31	2.406	1.373 6338	1861	79 16 34.96	38.38
2.407	1.374 4334	1692	28 44 28.36	40.27	2.407	1.373 8198	1859	79 17 13.32	38.34
2.408	1.374 6385	1690	28 45 08.61	40.23	2.408	1.374 0056	1857	79 17 51.64	38.30
2.409	1.374 8435	1691	28 45 48.84	40.19	2.409	1.374 1912	1855	79 18 29.93	38.27
2.410	1.374 1063	1697	28 46 28.99	40.15	2.410	1.374 3766	1853	79 19 08.18	38.23
2.411	1.374 3128	1695	28 47 09.13	40.11	2.411	1.374 5619	1852	79 19 46.39	38.19
2.412	1.374 5192	1693	28 47 49.22	40.07	2.412	1.374 7470	1850	79 20 24.56	38.15
2.413	1.374 7254	1691	28 48 29.28	40.03	2.413	1.374 9318	1848	79 21 02.70	38.12
2.414	1.374 9315	1690	28 49 09.29	40.00	2.414	1.375 1163	1846	79 21 40.80	38.08
2.415	1.375 1374	1697	28 49 49.27	39.96	2.415	1.375 3011	1844	79 22 18.86	38.04
2.416	1.375 3431	1695	28 50 29.21	39.92	2.416	1.375 4851	1843	79 22 56.88	38.00
2.417	1.375 5486	1693	28 51 09.10	39.88	2.417	1.375 6696	1841	79 23 34.87	37.97
2.418	1.375 7539	1691	28 51 48.96	39.83	2.418	1.375 8536	1839	79 24 12.81	37.93
2.419	1.375 9590	1690	28 52 28.78	39.80	2.419	1.376 0374	1837	79 24 50.73	37.89
2.420	1.376 1641	1698	28 53 08.56	39.76	2.420	1.376 2210	1835	79 25 28.60	37.85
2.421	1.376 3691	1696	28 53 48.30	39.72	2.421	1.376 4044	1833	79 26 06.44	37.82
2.422	1.376 5740	1694	28 54 28.01	39.68	2.422	1.376 5877	1832	79 26 44.24	37.78
2.423	1.376 7789	1692	28 55 07.67	39.64	2.423	1.376 7708	1830	79 27 22.00	37.74
2.424	1.376 9839	1690	28 55 47.29	39.61	2.424	1.376 9537	1828	79 28 00.73	37.71
2.425	1.377 1888	1698	28 56 26.88	39.57	2.425	1.377 1361	1826	79 28 38.41	37.67
2.426	1.377 3936	1696	28 57 06.43	39.53	2.426	1.377 3189	1824	79 29 16.07	37.63
2.427	1.377 5984	1694	28 57 45.91	39.49	2.427	1.377 5013	1823	79 30 52.68	37.60
2.428	1.377 8031	1691	28 58 25.39	39.45	2.428	1.377 6831	1821	79 31 29.26	37.56
2.429	1.378 0078	1691	28 59 04.84	39.41	2.429	1.377 8655	1819	79 32 07.80	37.53
2.430	1.378 2125	1699	28 59 44.23	39.37	2.430	1.378 0473	1817	79 32 45.30	37.49
2.431	1.378 4171	1697	29 00 23.58	39.33	2.431	1.378 2289	1816	79 33 22.77	37.45
2.432	1.378 6217	1695	29 01 02.89	39.29	2.432	1.378 4104	1814	79 34 00.20	37.41
2.433	1.378 8262	1693	29 01 42.17	39.25	2.433	1.378 5917	1812	79 34 37.59	37.37
2.434	1.379 0307	1691	29 02 21.41	39.22	2.434	1.378 7728	1810	79 35 14.96	37.34
2.435	1.379 2352	1690	29 03 00.61	39.18	2.435	1.378 9537	1808	79 35 52.27	37.30
2.436	1.379 4397	1698	29 03 39.77	39.14	2.436	1.379 1345	1807	79 36 29.55	37.26
2.437	1.379 6442	1696	29 04 18.89	39.10	2.437	1.379 3150	1805	79 37 06.80	37.23
2.438	1.379 8487	1694	29 04 57.97	39.06	2.438	1.379 4954	1803	79 37 44.01	37.19
2.439	1.379 1032	1692	29 05 37.02	39.03	2.439	1.379 6757	1801	79 38 21.18	37.15
2.440	1.380 3081	1890	79 06 16.03	38.99	2.440	1.380 8557	1800	79 39 58.32	37.12
α	$2 \tan^{-1} \frac{\alpha}{2}$	$\sin \alpha$	$2 \tan^{-1} \frac{\alpha}{2}$	$\sin \alpha$	α	$2 \tan^{-1} \frac{\alpha}{2}$	$\sin \alpha$	$2 \tan^{-1} \frac{\alpha}{2}$	$\sin \alpha$

The Gudermannian.

u	gd u	=F ₁ '	gd u	=F ₁ '	u	gd u	=F ₁ '	gd u	=F ₁ '
2.400	1.389 8357	1800	79 37 58.32	37.12	2.490	1.398 6356	1713	80 08 09.31	35.34
.401	.300 0156	1798	79 38 35.42	37.08	.491	.308 8069	1711	80 08 41.54	35.30
.402	.300 2153	1796	79 39 12.48	37.05	.492	.308 9770	1710	80 09 19.94	35.27
.403	.300 3910	1794	79 39 49.51	37.01	.493	.309 1488	1708	80 09 55.16	35.21
.404	.300 5741	1792	79 40 26.50	36.97	.494	.309 3195	1706	80 10 30.37	35.20
2.405	1.390 7531	1791	79 41 03.45	36.94	2.455	1.399 3901	1705	80 11 05.55	35.16
.406	.300 9181	1789	79 41 40.37	36.90	.495	.309 6605	1703	80 11 40.70	35.11
.407	.301 1111	1787	79 42 17.25	36.86	.497	.309 8307	1701	80 12 15.81	35.09
.408	.301 2807	1785	79 42 54.10	36.83	.498	.300 0007	1700	80 12 50.88	35.06
.409	.301 4681	1784	79 43 30.91	36.79	.499	.300 1706	1698	80 13 25.92	35.04
2.410	1.391 6164	1782	79 44 07.68	36.75	2.460	1.400 3303	1696	80 14 00.93	34.99
.411	.301 8245	1780	79 44 44.42	36.72	.491	.400 5909	1695	80 14 35.99	34.95
.412	.302 0025	1778	79 45 21.12	36.68	.492	.400 8601	1693	80 15 10.81	34.92
.413	.302 1802	1777	79 45 57.78	36.65	.493	.401 1298	1691	80 15 45.74	34.89
.414	.302 3578	1775	79 46 34.41	36.61	.494	.401 4073	1690	80 16 20.61	34.85
2.415	1.392 5352	1773	79 47 11.00	36.57	2.465	1.401 1664	1688	80 16 55.45	34.82
.416	.302 7124	1771	79 47 47.56	36.54	.495	.401 4351	1686	80 17 30.25	34.78
.417	.302 8895	1770	79 48 24.08	36.50	.497	.401 7047	1685	80 18 05.01	34.75
.418	.303 0661	1768	79 49 00.57	36.47	.498	.401 9741	1683	80 18 39.74	34.71
.419	.303 2431	1766	79 49 37.02	36.43	.499	.402 2433	1681	80 19 14.44	34.68
2.420	1.393 4196	1764	79 50 13.43	36.39	2.470	1.402 0283	1680	80 19 49.10	34.65
.421	.303 5960	1763	79 50 49.80	36.36	.491	.402 3072	1678	80 20 23.73	34.61
.422	.303 7722	1761	79 51 26.15	36.32	.492	.402 5859	1676	80 20 58.33	34.58
.423	.303 9480	1759	79 52 02.45	36.29	.493	.402 8645	1675	80 21 32.89	34.54
.424	.304 1240	1758	79 52 38.72	36.25	.494	.403 1429	1673	80 22 07.41	34.51
2.425	1.394 2067	1756	79 53 14.96	36.22	2.475	1.402 8661	1672	80 22 41.91	34.48
.426	.304 4752	1754	79 53 51.15	36.18	.495	.403 1432	1670	80 23 16.40	34.44
.427	.304 6505	1752	79 54 27.32	36.14	.497	.403 4201	1668	80 23 50.79	34.41
.428	.304 8257	1751	79 55 03.44	36.11	.498	.403 6968	1666	80 24 25.18	34.37
.429	.305 0005	1749	79 55 39.51	36.07	.499	.403 9731	1665	80 25 09.54	34.34
2.430	1.395 1751	1747	79 56 15.59	36.04	2.480	1.403 6978	1663	80 25 34.89	34.31
.431	.305 3501	1745	79 56 51.61	36.00	.491	.403 9760	1662	80 26 09.15	34.27
.432	.305 5245	1744	79 57 27.60	35.97	.492	.404 2541	1660	80 26 43.49	34.24
.433	.305 6988	1742	79 58 03.55	35.93	.493	.404 5320	1658	80 27 17.64	34.20
.434	.305 8730	1740	79 58 39.46	35.90	.494	.404 8097	1657	80 27 59.81	34.17
2.435	1.396 0469	1739	79 59 15.34	35.86	2.485	1.404 5203	1655	80 28 24.97	34.14
.435	.306 2207	1737	79 59 51.19	35.83	.495	.404 7977	1653	80 28 59.09	34.10
.437	.306 3943	1735	80 00 26.09	35.79	.497	.405 0750	1652	80 29 33.17	34.07
.438	.306 5677	1733	80 01 02.77	35.76	.498	.405 3521	1650	80 30 07.23	34.04
.439	.306 7410	1732	80 01 38.31	35.72	.499	.405 6290	1648	80 30 41.25	34.00
2.440	1.396 9141	1730	80 02 14.31	35.69	2.490	1.405 3548	1647	80 31 15.23	33.97
.441	.307 0870	1728	80 02 49.88	35.65	.491	.405 6304	1645	80 31 49.19	33.94
.442	.307 2607	1727	80 03 25.31	35.62	.492	.405 9058	1644	80 32 23.10	33.90
.443	.307 4343	1725	80 04 01.11	35.58	.493	.406 1811	1642	80 32 56.99	33.87
.444	.307 6047	1723	80 04 36.69	35.54	.494	.406 4562	1640	80 33 30.81	33.84
2.445	1.397 7770	1722	80 05 12.20	35.51	2.495	1.406 1762	1639	80 34 04.66	33.80
.445	.307 9600	1720	80 05 47.69	35.48	.495	.406 4500	1637	80 34 38.45	33.77
.447	.308 1300	1718	80 06 23.15	35.44	.497	.406 7246	1636	80 35 12.20	33.74
.448	.308 3028	1716	80 06 58.57	35.41	.498	.406 9991	1634	80 35 45.02	33.70
.449	.308 4644	1715	80 07 33.96	35.37	.499	.407 2734	1632	80 36 19.00	33.67
2.450	1.398 6356	1713	80 08 09.31	35.34	2.500	1.406 9936	1631	80 36 53.26	33.64
u	2 tan ⁻¹ (u) = $\frac{\pi}{2}$	u sech u	2 tan ⁻¹ (u) = 90°	u sech u	u	2 tan ⁻¹ (u) = $\frac{\pi}{2}$	u sech u	2 tan ⁻¹ (u) = 90°	u sech u

The Gendermainstreaming

u	u^2	u^3	u^4	u^5	u	u^2	u^3	u^4	u^5
2.500	6.250	15.625	39.062	97.656	2.550	6.503	16.791	43.438	110.803
2.510	6.300	15.751	39.506	98.506	2.560	6.554	16.912	43.789	111.664
2.520	6.352	15.884	40.000	99.408	2.570	6.605	17.034	44.142	112.527
2.530	6.404	16.018	40.496	100.362	2.580	6.657	17.157	44.497	113.392
2.540	6.457	16.153	41.000	101.368	2.590	6.709	17.281	44.854	114.259
2.600	6.760	17.872	46.976	121.680	2.650	7.023	18.826	49.959	129.853
2.700	7.290	20.539	55.584	147.263	2.750	7.563	21.707	59.729	164.583
2.800	7.840	22.384	63.904	173.696	2.850	8.113	24.769	70.919	200.000
2.900	8.410	24.459	73.000	201.649	2.950	8.683	28.019	83.619	237.175
3.000	9.000	26.730	83.000	231.000	3.050	9.273	31.469	97.919	276.175
3.100	9.610	29.241	93.976	261.849	3.150	9.883	35.129	113.819	317.000
3.200	10.240	31.992	105.904	294.624	3.250	10.513	38.999	131.319	359.750
3.300	10.890	34.973	118.800	329.496	3.350	11.163	43.079	150.519	404.500
3.400	11.560	38.184	132.656	366.520	3.450	11.833	47.369	171.519	451.250
3.500	12.250	41.625	147.500	405.875	3.550	12.523	51.879	194.419	500.000
3.600	12.960	45.296	163.376	447.744	3.650	13.233	56.609	219.319	550.750
3.700	13.690	49.209	180.300	491.749	3.750	13.963	61.559	246.319	603.500
3.800	14.440	53.364	198.304	538.944	3.850	14.713	66.729	275.519	658.250
3.900	15.210	57.761	217.400	589.349	3.950	15.483	72.129	306.919	715.000
4.000	16.000	62.400	238.400	643.200	4.050	16.273	77.759	340.519	773.750
4.100	16.810	67.281	260.400	700.649	4.150	17.083	83.609	376.419	834.500
4.200	17.640	72.404	283.400	761.824	4.250	17.913	89.679	414.619	897.250
4.300	18.490	77.769	307.400	826.849	4.350	18.763	95.969	455.119	962.000
4.400	19.360	83.376	332.400	895.824	4.450	19.633	102.479	497.919	1028.750
4.500	20.250	89.225	358.400	968.875	4.550	20.523	109.209	543.019	1097.500
4.600	21.160	95.316	385.400	1046.144	4.650	21.433	116.159	590.419	1168.250
4.700	22.090	101.659	413.400	1127.649	4.750	22.363	123.329	640.019	1241.000
4.800	23.040	108.256	442.400	1213.424	4.850	23.313	130.719	691.819	1315.750
4.900	24.010	115.109	472.400	1303.599	4.950	24.283	138.329	745.619	1392.500
5.000	25.000	122.250	503.500	1398.125	5.050	25.273	146.159	801.519	1471.250
5.100	26.010	129.681	535.600	1497.149	5.150	26.283	154.209	859.519	1552.000
5.200	27.040	137.404	568.800	1600.624	5.250	27.313	162.479	919.619	1634.750
5.300	28.090	145.429	603.100	1708.649	5.350	28.363	170.969	981.819	1719.500
5.400	29.160	153.756	638.600	1821.224	5.450	29.433	179.679	1046.219	

The Gudermannian.

u	gd u	uF'	gd u	uF'	u	gd u	uF'	gd u	uF'
2.600	1.422 5314	1477	81 30 16.11	30.47	2.650	1.429 7283	1406	81 55 02.63	29.00
.601	.422 6691	1476	81 30 46.56	30.44	.651	.429 8888	1405	81 55 31.62	28.97
.602	.422 8166	1474	81 31 16.99	30.41	.652	.430 0092	1403	81 56 00.58	28.94
.603	.422 9640	1473	81 31 47.39	30.38	.653	.430 1495	1402	81 56 29.51	28.92
.604	.423 1112	1471	81 32 17.75	30.35	.654	.430 2896	1400	81 56 58.41	28.89
2.605	1.423 2583	1470	81 32 48.00	30.32	2.655	1.430 4296	1399	81 57 27.28	28.86
.606	.423 4052	1469	81 33 18.40	30.29	.656	.430 5694	1398	81 57 56.12	28.83
.607	.423 5520	1467	81 33 48.67	30.26	.657	.430 7091	1396	81 58 24.94	28.80
.608	.423 6986	1466	81 34 18.93	30.23	.658	.430 8487	1395	81 58 53.72	28.77
.609	.423 8451	1464	81 34 49.44	30.20	.659	.430 9881	1394	81 59 22.48	28.74
2.610	1.423 9915	1463	81 35 19.32	30.17	2.660	1.431 1274	1392	81 59 51.21	28.72
.611	.424 1377	1461	81 35 49.48	30.14	.661	.431 2665	1391	82 00 19.91	28.69
.612	.424 2837	1460	81 36 19.61	30.11	.662	.431 4055	1389	82 00 48.58	28.66
.613	.424 4297	1458	81 36 49.71	30.08	.663	.431 5444	1388	82 01 17.21	28.63
.614	.424 5754	1457	81 37 19.77	30.05	.664	.431 6831	1387	82 01 45.84	28.60
2.615	1.424 7211	1456	81 37 49.81	30.02	2.665	1.431 8217	1385	82 02 14.43	28.57
.616	.424 8665	1454	81 38 19.82	30.00	.666	.431 9602	1384	82 02 42.90	28.55
.617	.425 0119	1453	81 38 49.80	29.96	.667	.432 0985	1383	82 03 11.59	28.52
.618	.425 1571	1451	81 39 19.75	29.93	.668	.432 2367	1381	82 03 40.02	28.50
.619	.425 3021	1450	81 39 49.67	29.90	.669	.432 3747	1380	82 04 08.50	28.46
2.620	1.425 4470	1448	81 40 19.56	29.87	2.670	1.432 5127	1378	82 04 36.95	28.43
.621	.425 5918	1447	81 40 49.42	29.85	.671	.432 6504	1377	82 05 05.36	28.40
.622	.425 7364	1446	81 41 19.25	29.82	.672	.432 7881	1376	82 05 33.75	28.38
.623	.425 8809	1444	81 41 49.05	29.79	.673	.432 9256	1374	82 06 02.12	28.35
.624	.426 0252	1443	81 42 18.82	29.76	.674	.433 0639	1373	82 06 30.45	28.32
2.625	1.426 1694	1441	81 42 48.56	29.73	2.675	1.433 2022	1372	82 06 58.76	28.29
.626	.426 3135	1440	81 43 18.28	29.70	.676	.433 3373	1370	82 07 27.03	28.26
.627	.426 4574	1438	81 43 47.96	29.67	.677	.433 4722	1369	82 07 55.28	28.24
.628	.426 6012	1437	81 44 17.61	29.64	.678	.433 6070	1368	82 08 23.51	28.21
.629	.426 7448	1436	81 44 47.24	29.61	.679	.433 7417	1366	82 08 51.70	28.18
2.630	1.426 8883	1434	81 45 16.83	29.58	2.680	1.433 8843	1365	82 09 19.86	28.15
.631	.427 0316	1433	81 45 46.40	29.55	.681	.434 0207	1363	82 09 48.00	28.12
.632	.427 1748	1431	81 46 15.91	29.52	.682	.434 1570	1362	82 10 16.11	28.10
.633	.427 3179	1430	81 46 45.44	29.49	.683	.434 2931	1361	82 10 44.20	28.07
.634	.427 4608	1428	81 47 14.92	29.46	.684	.434 4291	1359	82 11 12.25	28.04
2.635	1.427 6036	1427	81 47 44.37	29.43	2.685	1.434 5690	1358	82 11 40.28	28.01
.636	.427 7462	1426	81 48 13.79	29.41	.686	.434 7098	1357	82 12 08.28	27.99
.637	.427 8887	1424	81 48 43.18	29.38	.687	.434 8504	1355	82 12 36.25	27.96
.638	.428 0310	1423	81 49 12.55	29.35	.688	.434 9919	1354	82 13 04.19	27.93
.639	.428 1732	1421	81 49 41.88	29.32	.689	.435 1072	1353	82 13 32.11	27.90
2.640	1.428 3153	1420	81 50 11.18	29.29	2.690	1.435 2494	1351	82 13 59.99	27.87
.641	.428 4572	1419	81 50 40.46	29.26	.691	.435 3775	1350	82 14 27.80	27.85
.642	.428 5990	1417	81 51 09.70	29.23	.692	.435 5124	1349	82 14 55.66	27.82
.643	.428 7407	1416	81 51 38.99	29.20	.693	.435 6472	1347	82 15 23.49	27.79
.644	.428 8822	1414	81 52 08.11	29.17	.694	.435 7810	1346	82 15 51.27	27.77
2.645	1.429 0236	1413	81 52 37.27	29.14	2.695	1.435 9164	1345	82 16 19.02	27.74
.646	.429 1648	1412	81 53 06.40	29.12	.696	.436 0508	1343	82 16 46.75	27.71
.647	.429 3059	1410	81 53 35.50	29.09	.697	.436 1851	1342	82 17 14.44	27.68
.648	.429 4468	1409	81 54 04.57	29.06	.698	.436 3192	1341	82 17 42.11	27.65
.649	.429 5876	1407	81 54 33.62	29.03	.699	.436 4532	1339	82 18 09.75	27.63
2.650	1.429 7283	1406	81 55 02.63	29.00	2.700	1.436 5871	1338	82 18 37.36	27.60
u	$2 \tan^{-1}(e^u) - \frac{\pi}{2}$	u sech u	$2 \tan^{-1}(e^u) - 60^\circ$	u sech u	u	$2 \tan^{-1}(e^u) - \frac{\pi}{2}$	u sech u	$2 \tan^{-1}(e^u) - 60^\circ$	u sech u

SMITHSONIAN TABLES

The Gudermannian.

u	$\sin u$	$\cos u$	$\tan u$	$\sec u$	u	$\sin u$	$\cos u$	$\tan u$	$\sec u$
2.700	1.436 5871	1338	82 18 37.36	27.60	2.750	1.443 1144	1473	82 41 03.70	26.26
.701	.436 7709	1337	82 19 04.05	27.57	.751	.443 2416	1472	82 41 29.05	26.24
.702	.436 8545	1335	82 19 32.51	27.54	.752	.443 3688	1471	82 41 56.18	26.21
.703	.436 9879	1334	82 20 00.04	27.52	.753	.443 4958	1470	82 42 22.38	26.19
.704	.437 1213	1333	82 20 27.54	27.49	.754	.443 6227	1468	82 42 48.55	26.16
2.705	1.437 2545	1331	82 20 55.02	27.46	2.755	1.443 7495	1467	82 43 14.70	26.14
.706	.437 3876	1330	82 21 22.47	27.44	.756	.443 8761	1466	82 43 40.82	26.11
.707	.437 5205	1329	82 21 49.89	27.41	.757	.444 0026	1465	82 44 06.92	26.08
.708	.437 6533	1327	82 22 17.29	27.38	.758	.444 1290	1463	82 44 32.99	26.05
.709	.437 7860	1326	82 22 44.66	27.35	.759	.444 2553	1462	82 44 59.03	26.03
2.710	1.437 9186	1325	82 23 12.00	27.33	2.760	1.444 3814	1461	82 45 25.05	26.01
.711	.438 0510	1324	82 23 39.31	27.30	.761	.444 5074	1460	82 45 51.04	25.98
.712	.438 1833	1323	82 24 06.60	27.27	.762	.444 6333	1458	82 46 17.01	25.95
.713	.438 3154	1321	82 24 33.86	27.25	.763	.444 7591	1457	82 46 42.95	25.93
.714	.438 4475	1320	82 25 01.09	27.22	.764	.444 8847	1456	82 47 08.87	25.90
2.715	1.438 5794	1318	82 25 28.29	27.19	2.765	1.445 0102	1455	82 47 34.77	25.88
.716	.438 7111	1317	82 25 55.47	27.17	.766	.445 1356	1453	82 48 00.62	25.85
.717	.438 8428	1316	82 26 22.63	27.14	.767	.445 2609	1452	82 48 26.46	25.83
.718	.438 9743	1314	82 26 49.75	27.11	.768	.445 3860	1451	82 48 52.27	25.80
.719	.439 1057	1313	82 27 16.85	27.08	.769	.445 5111	1450	82 49 18.06	25.77
2.720	1.439 2369	1312	82 27 43.93	27.06	2.770	1.445 6360	1448	82 49 43.83	25.75
.721	.439 3680	1310	82 28 10.95	27.03	.771	.445 7607	1447	82 50 09.56	25.72
.722	.439 4990	1309	82 28 37.98	27.00	.772	.445 8854	1446	82 50 35.27	25.70
.723	.439 6300	1308	82 29 04.97	26.98	.773	.446 0099	1445	82 51 00.95	25.67
.724	.439 7606	1307	82 29 31.94	26.95	.774	.446 1343	1443	82 51 26.61	25.65
2.725	1.439 8912	1305	82 29 58.87	26.92	2.775	1.446 2586	1442	82 51 52.25	25.62
.726	.440 0216	1304	82 30 25.79	26.90	.776	.446 3827	1441	82 52 17.86	25.60
.727	.440 1520	1303	82 30 52.67	26.87	.777	.446 5068	1440	82 52 43.44	25.57
.728	.440 2823	1301	82 31 19.53	26.84	.778	.446 6307	1438	82 53 09.00	25.55
.729	.440 4123	1300	82 31 46.36	26.82	.779	.446 7545	1437	82 53 34.53	25.52
2.730	1.440 5429	1299	82 32 13.16	26.79	2.780	1.446 8781	1436	82 54 00.04	25.49
.731	.440 6720	1298	82 32 39.94	26.76	.781	.447 0017	1435	82 54 25.52	25.47
.732	.440 8017	1296	82 33 06.69	26.74	.782	.447 1251	1434	82 54 50.98	25.44
.733	.440 9313	1295	82 33 33.42	26.71	.783	.447 2484	1433	82 55 16.41	25.42
.734	.441 0607	1294	82 34 00.11	26.68	.784	.447 3716	1431	82 55 41.81	25.39
2.735	1.441 1900	1292	82 34 26.78	26.66	2.785	1.447 4946	1430	82 56 07.19	25.37
.736	.441 3192	1291	82 34 53.43	26.63	.786	.447 6175	1429	82 56 32.55	25.34
.737	.441 4483	1290	82 35 20.05	26.61	.787	.447 7403	1427	82 56 57.88	25.32
.738	.441 5772	1289	82 35 46.64	26.58	.788	.447 8630	1426	82 57 23.19	25.29
.739	.441 7060	1287	82 36 13.21	26.55	.789	.447 9856	1425	82 57 48.47	25.27
2.740	1.441 8347	1286	82 36 39.75	26.53	2.790	1.448 1080	1424	82 58 13.72	25.24
.741	.441 9632	1285	82 37 06.26	26.50	.791	.448 2303	1423	82 58 38.95	25.22
.742	.442 0916	1283	82 37 32.75	26.47	.792	.448 3525	1421	82 59 04.16	25.19
.743	.442 2199	1282	82 37 59.21	26.45	.793	.448 4746	1420	82 59 29.34	25.17
.744	.442 3481	1281	82 38 25.64	26.42	.794	.448 5966	1419	82 59 54.49	25.14
2.745	1.442 4761	1280	82 38 52.05	26.40	2.795	1.448 7184	1418	82 60 19.62	25.12
.746	.442 6040	1278	82 39 18.43	26.37	.796	.448 8401	1417	82 60 44.73	25.09
.747	.442 7318	1277	82 39 44.79	26.34	.797	.448 9617	1415	82 61 09.81	25.07
.748	.442 8594	1276	82 40 11.12	26.32	.798	.449 0832	1414	82 61 34.86	25.04
.749	.442 9870	1275	82 40 37.42	26.29	.799	.449 2045	1413	82 61 59.99	25.02
2.750	1.443 1144	1273	82 41 03.70	26.26	2.800	1.449 3258	1412	82 62 24.90	24.99
u	$2 \tan^{-1}(\sec u)$	$\frac{\pi}{2}$	$2 \tan^{-1}(\sec u)$	$\frac{\pi}{2}$	u	$2 \tan^{-1}(\sec u)$	$\frac{\pi}{2}$	$2 \tan^{-1}(\sec u)$	$\frac{\pi}{2}$

The Gudermannian.

z	$gd\ z$	wFz	$gd\ z$	wFz	z	$gd\ z$	wFz	$gd\ z$	wFz
2.800	1.449 3298	1212	83 02 24.00	24.90	2.850	1.455 2365	1153	83 22 44.07	23.78
.801	1.449 4469	1211	83 02 49.88	24.97	.851	1.455 3517	1152	83 23 07.84	23.76
.802	1.449 5670	1209	83 03 14.84	24.94	.852	1.455 4668	1151	83 23 31.59	23.74
.803	1.449 6888	1208	83 03 39.77	24.92	.853	1.455 5819	1150	83 23 55.31	23.71
.804	1.449 8095	1207	83 04 04.68	24.89	.854	1.455 6968	1148	83 24 19.01	23.69
2.805	1.449 9301	1206	83 04 29.56	24.87	2.855	1.455 8115	1147	83 24 42.69	23.67
.806	1.450 0507	1205	83 04 54.42	24.85	.856	1.455 9262	1146	83 25 06.34	23.64
.807	1.450 1710	1203	83 05 19.35	24.83	.857	1.456 0408	1145	83 25 30.07	23.62
.808	1.450 2913	1202	83 05 44.00	24.80	.858	1.456 1553	1144	83 25 53.58	23.59
.809	1.450 4115	1201	83 06 08.84	24.77	.859	1.456 2696	1143	83 26 17.16	23.57
2.810	1.450 5315	1200	83 06 33.60	24.75	2.860	1.456 3838	1142	83 26 40.72	23.55
.811	1.450 6514	1199	83 06 58.33	24.72	.861	1.456 4979	1140	83 27 04.25	23.52
.812	1.450 7712	1198	83 07 23.04	24.70	.862	1.456 6120	1139	83 27 27.77	23.50
.813	1.450 8909	1195	83 07 47.73	24.67	.863	1.456 7258	1138	83 27 51.26	23.48
.814	1.451 0105	1195	83 08 12.39	24.65	.864	1.456 8395	1137	83 28 14.72	23.45
2.815	1.451 1300	1194	83 08 37.03	24.62	2.865	1.456 9532	1136	83 28 38.16	23.43
.816	1.451 2492	1193	83 09 01.64	24.60	.866	1.457 0667	1135	83 29 01.58	23.41
.817	1.451 3681	1191	83 09 26.23	24.58	.867	1.457 1801	1134	83 29 24.98	23.38
.818	1.451 4875	1190	83 09 50.79	24.55	.868	1.457 2935	1133	83 29 48.35	23.36
.819	1.451 6065	1189	83 10 15.33	24.53	.869	1.457 4067	1131	83 30 11.70	23.34
2.820	1.451 7253	1188	83 10 39.84	24.50	2.870	1.457 5198	1130	83 30 35.03	23.32
.821	1.451 8441	1187	83 11 04.33	24.48	.871	1.457 6327	1129	83 30 58.33	23.30
.822	1.451 9627	1186	83 11 28.80	24.45	.872	1.457 7455	1128	83 31 21.61	23.27
.823	1.452 0812	1184	83 11 53.24	24.43	.873	1.457 8584	1127	83 31 44.87	23.25
.824	1.452 1995	1183	83 12 17.66	24.41	.874	1.457 9710	1126	83 32 08.11	23.23
2.825	1.452 3178	1182	83 12 42.05	24.38	2.875	1.458 0835	1125	83 32 31.32	23.20
.826	1.452 4359	1181	83 13 06.42	24.36	.876	1.458 1959	1124	83 32 54.50	23.18
.827	1.452 5540	1180	83 13 30.76	24.33	.877	1.458 3083	1123	83 33 17.67	23.15
.828	1.452 6719	1178	83 13 55.08	24.31	.878	1.458 4204	1121	83 33 40.81	23.13
.829	1.452 7897	1177	83 14 19.38	24.28	.879	1.458 5325	1120	83 34 03.93	23.11
2.830	1.452 9073	1176	83 14 43.65	24.26	2.880	1.458 6445	1119	83 34 27.03	23.08
.831	1.453 0249	1175	83 15 07.90	24.24	.881	1.458 7564	1118	83 34 50.10	23.06
.832	1.453 1423	1174	83 15 32.12	24.21	.882	1.458 8681	1117	83 35 13.15	23.04
.833	1.453 2597	1173	83 15 56.32	24.19	.883	1.458 9798	1116	83 35 36.18	23.02
.834	1.453 3769	1171	83 16 20.50	24.16	.884	1.459 0913	1115	83 35 59.18	23.00
2.835	1.453 4940	1170	83 16 44.65	24.14	2.885	1.459 2027	1114	83 36 22.16	22.97
.836	1.453 6109	1169	83 17 08.78	24.12	.886	1.459 3140	1113	83 36 45.12	22.95
.837	1.453 7278	1168	83 17 32.88	24.09	.887	1.459 4252	1111	83 37 08.06	22.93
.838	1.453 8445	1167	83 17 56.96	24.07	.888	1.459 5363	1110	83 37 30.97	22.90
.839	1.453 9612	1166	83 18 21.02	24.04	.889	1.459 6473	1109	83 37 53.86	22.88
2.840	1.454 0777	1165	83 18 45.05	24.02	2.890	1.459 7581	1108	83 38 16.73	22.85
.841	1.454 1941	1163	83 19 09.06	24.00	.891	1.459 8689	1107	83 38 39.57	22.83
.842	1.454 3104	1162	83 19 33.04	23.97	.892	1.459 9795	1106	83 39 02.40	22.81
.843	1.454 4265	1161	83 19 57.01	23.95	.893	1.460 0901	1105	83 39 25.19	22.79
.844	1.454 5426	1160	83 20 20.94	23.93	.894	1.460 2005	1104	83 39 47.97	22.77
2.845	1.454 6585	1159	83 20 44.86	23.90	2.895	1.460 3108	1103	83 40 10.73	22.74
.846	1.454 7743	1158	83 21 08.74	23.88	.896	1.460 4210	1101	83 40 33.46	22.72
.847	1.454 8900	1156	83 21 32.61	23.85	.897	1.460 5311	1100	83 40 56.17	22.70
.848	1.455 0056	1155	83 21 56.45	23.83	.898	1.460 6411	1099	83 41 18.85	22.68
.849	1.455 1211	1154	83 22 20.27	23.81	.899	1.460 7510	1098	83 41 41.52	22.65
2.850	1.455 2365	1153	83 22 44.07	23.78	2.900	1.460 8607	1097	83 42 04.16	22.63
u	$2 \tan^{-1}(e^u) - \frac{\pi}{2}$	u sech u	$2 \tan^{-1}(e^u) - 90^\circ$	u sech u	u	$2 \tan^{-1}(e^u) - \frac{\pi}{2}$	u sech u	$2 \tan^{-1}(e^u) - 90^\circ$	u sech u

The Gudermannian.

x	$\operatorname{gd} x$	$\operatorname{sech} x$	$\operatorname{gd} x$	$\operatorname{sech} x$	x	$\operatorname{gd} x$	$\operatorname{sech} x$	$\operatorname{gd} x$	$\operatorname{sech} x$
2.000	1.460 8607	1097	83 42 04.16	22.63	2.050	1.466 2123	1044	84 00 28.00	21.53
.001	.460 0704	1095	83 42 26.78	22.61	.051	.466 1167	1043	84 00 49.53	21.51
.002	.461 0800	1093	83 42 40.37	22.59	.052	.466 4309	1042	84 01 11.03	21.49
.003	.461 1804	1094	83 43 11.95	22.56	.053	.466 5251	1041	84 01 32.51	21.47
.004	.461 2807	1093	83 43 34.50	22.54	.054	.466 6201	1040	84 01 53.67	21.45
2.005	1.461 4080	1092	83 43 57.03	22.52	2.055	1.466 7130	1039	84 02 15.40	21.43
.006	.461 5171	1091	83 44 19.54	22.50	.056	.466 8068	1038	84 02 36.82	21.40
.007	.461 6261	1090	83 44 42.02	22.47	.057	.466 9106	1037	84 02 58.11	21.38
.008	.461 7350	1088	83 45 04.48	22.45	.058	.466 0142	1036	84 03 19.58	21.35
.009	.461 8438	1087	83 45 26.92	22.43	.059	.466 1177	1035	84 03 40.93	21.34
2.010	1.461 9523	1086	83 45 49.34	22.41	2.060	1.466 2511	1034	84 04 02.27	21.32
.011	.462 0610	1085	83 46 11.73	22.38	.061	.466 1544	1033	84 04 23.57	21.30
.012	.462 1695	1084	83 46 34.11	22.36	.062	.466 2576	1032	84 04 44.85	21.28
.013	.462 2779	1083	83 46 56.46	22.34	.063	.466 3607	1031	84 05 06.13	21.26
.014	.462 3861	1082	83 47 18.79	22.32	.064	.466 4637	1030	84 05 27.37	21.23
2.015	1.462 4942	1081	83 47 41.00	22.30	2.065	1.466 5666	1028	84 05 48.60	21.21
.016	.462 6023	1080	83 48 03.38	22.27	.066	.466 6694	1027	84 06 09.80	21.19
.017	.462 7102	1079	83 48 25.61	22.25	.067	.466 7721	1026	84 06 30.98	21.17
.018	.462 8180	1078	83 48 47.88	22.23	.068	.466 8747	1025	84 06 52.14	21.15
.019	.462 9257	1077	83 49 10.10	22.21	.069	.466 9772	1024	84 07 13.29	21.13
2.020	1.463 0334	1076	83 49 32.29	22.18	2.070	1.466 2796	1023	84 07 34.40	21.11
.021	.463 1409	1074	83 49 54.47	22.16	.071	.466 3819	1022	84 07 55.50	21.09
.022	.463 2483	1073	83 50 16.62	22.14	.072	.466 4841	1021	84 08 16.58	21.07
.023	.463 3555	1072	83 50 38.75	22.12	.073	.466 5861	1020	84 08 37.64	21.05
.024	.463 4627	1071	83 51 00.86	22.10	.074	.466 6881	1019	84 08 58.67	21.03
2.025	1.463 5698	1070	83 51 22.94	22.07	2.075	1.466 7900	1018	84 09 19.66	21.01
.026	.463 6768	1069	83 51 45.00	22.05	.076	.466 8918	1017	84 09 40.63	20.98
.027	.463 7836	1068	83 52 07.05	22.03	.077	.466 9935	1016	84 10 01.60	20.96
.028	.463 8904	1067	83 52 29.07	22.01	.078	.466 0950	1015	84 10 22.60	20.94
.029	.463 9970	1066	83 52 51.06	21.99	.079	.466 1965	1014	84 10 43.53	20.92
2.030	1.464 1036	1065	83 53 13.04	21.97	2.080	1.466 2979	1013	84 11 04.44	20.90
.031	.464 2100	1064	83 53 34.99	21.94	.081	.466 3992	1012	84 11 25.31	20.88
.032	.464 3163	1063	83 53 56.93	21.92	.082	.466 5003	1011	84 11 46.20	20.86
.033	.464 4226	1062	83 54 18.84	21.90	.083	.466 6014	1010	84 12 07.08	20.84
.034	.464 5287	1061	83 54 40.73	21.88	.084	.466 7024	1009	84 12 27.88	20.82
2.035	1.464 6347	1060	83 55 02.59	21.86	2.085	1.466 8033	1008	84 12 48.68	20.80
.036	.464 7406	1059	83 55 24.44	21.83	.086	.466 9040	1007	84 13 09.47	20.78
.037	.464 8464	1058	83 55 46.26	21.81	.087	.466 0047	1006	84 13 30.23	20.75
.038	.464 9521	1056	83 56 08.07	21.79	.088	.466 1053	1005	84 13 50.98	20.73
.039	.465 0577	1055	83 56 29.85	21.77	.089	.466 2057	1004	84 14 11.70	20.71
2.040	1.465 1632	1054	83 56 51.60	21.75	2.090	1.466 3061	1003	84 14 32.40	20.69
.041	.465 2686	1053	83 57 13.34	21.73	.091	.466 4064	1002	84 14 53.09	20.67
.042	.465 3739	1052	83 57 35.06	21.70	.092	.466 5066	1001	84 15 13.75	20.65
.043	.465 4799	1051	83 57 56.75	21.68	.093	.466 6066	1000	84 15 34.34	20.63
.044	.465 5841	1050	83 58 18.42	21.66	.094	.466 7066	999	84 15 55.01	20.61
2.045	1.465 6891	1049	83 58 40.07	21.64	2.095	1.466 8065	998	84 16 15.61	20.59
.046	.465 7939	1048	83 59 01.70	21.62	.096	.466 9064	997	84 16 36.19	20.57
.047	.465 8987	1047	83 59 23.31	21.60	.097	.466 0063	996	84 16 56.75	20.55
.048	.466 0033	1046	83 59 44.90	21.58	.098	.466 1061	995	84 17 17.29	20.53
.049	.466 1079	1045	84 00 06.46	21.55	.099	.466 2059	994	84 17 37.81	20.51
2.050	1.466 2123	1044	84 00 28.00	21.53	3.000	1.471 3943	993	84 17 58.30	20.49
x	$2 \tan^{-1}(e^x) - \frac{\pi}{2}$	$\operatorname{sech} x$	$2 \tan^{-1}(e^x) - \frac{\pi}{2}$	$\operatorname{sech} x$	x	$2 \tan^{-1}(e^x) - \frac{\pi}{2}$	$\operatorname{sech} x$	$2 \tan^{-1}(e^x) - \frac{\pi}{2}$	$\operatorname{sech} x$

The Gudermannian.

u	gd u	=F ₁ '	gd u	=F ₁ '	u	gd u	=F ₁ '	gd u	=F ₁ '
3.00	1.471 3043	6033	84 17 58.30	204.88	3.50	1.510 4199	6034	86 32 26.47	124.46
.01	.472 2927	6035	84 21 22.17	202.85	.51	.511 0203	5974	86 34 30.31	123.22
.02	.473 2713	6037	84 24 44.01	200.84	.52	.512 0147	5913	86 36 32.02	122.00
.03	.474 2401	6041	84 28 03.86	198.85	.53	.512 2033	5850	86 38 34.31	120.79
.04	.475 2094	6045	84 31 21.72	196.88	.54	.512 7899	5787	86 40 34.50	119.59
3.05	1.476 1292	6151	84 34 37.63	194.93	3.55	1.513 2628	5740	86 42 33.49	118.40
.06	.477 0895	6157	84 37 51.59	193.00	.55	.513 0340	5683	86 44 31.30	117.22
.07	.478 0406	6164	84 41 03.64	191.09	.56	.514 4095	5627	86 46 27.94	116.06
.08	.478 0025	6173	84 44 13.78	189.20	.58	.515 0394	5571	86 48 23.43	114.91
.09	.479 8551	6182	84 47 22.04	187.32	.59	.515 6137	5516	86 50 17.76	113.66
3.10	1.480 7583	8553	84 50 28.43	185.47	3.60	1.516 1625	5461	86 52 10.96	112.63
.11	.481 6635	9003	84 53 32.07	183.63	.61	.516 7058	5406	86 54 03.03	111.52
.12	.482 5938	8814	84 56 35.69	181.81	.62	.517 2438	5353	86 55 53.99	110.41
.13	.483 5164	8727	84 59 36.59	180.00	.63	.517 7764	5300	86 57 43.85	109.31
.14	.484 2817	8640	85 02 35.70	178.22	.64	.518 3037	5247	86 59 32.62	108.22
3.15	1.485 1445	8583	85 05 33.04	176.45	3.65	1.518 8258	5195	87 01 20.30	107.15
.16	.485 9957	8470	85 08 38.61	174.70	.66	.519 3427	5143	87 03 06.92	106.08
.17	.486 8285	8386	85 11 42.45	172.97	.67	.519 8544	5092	87 04 52.47	105.03
.18	.487 6720	8303	85 14 44.36	171.26	.68	.520 3611	5041	87 06 36.68	103.99
.19	.488 4991	8221	85 17 04.97	169.56	.69	.520 8527	4991	87 08 20.45	102.95
3.20	1.489 3170	8130	85 19 53.69	167.88	3.70	1.521 3503	4942	87 10 02.89	101.93
.21	.490 1269	8058	85 22 40.73	166.21	.71	.521 8311	4893	87 11 44.31	100.92
.22	.490 9287	7986	85 25 26.12	164.56	.72	.522 3179	4844	87 13 24.73	99.91
.23	.491 7226	7909	85 28 09.86	162.93	.73	.522 8109	4796	87 15 04.14	98.92
.24	.492 5085	7821	85 30 51.99	161.32	.74	.523 2971	4748	87 16 42.57	97.94
3.25	1.493 2867	7743	85 33 32.59	159.74	3.75	1.523 7695	4701	87 18 20.02	96.96
.26	.494 0579	7667	85 36 11.42	158.13	.75	.524 2373	4654	87 19 56.59	95.99
.27	.494 8300	7590	85 38 48.77	156.56	.76	.524 7001	4608	87 21 32.33	95.05
.28	.495 5753	7513	85 41 24.35	155.01	.78	.525 1580	4564	87 23 06.69	94.10
.29	.496 3221	7441	85 43 58.79	153.47	.79	.525 6128	4517	87 24 40.43	93.17
3.30	1.497 0634	7367	85 46 31.50	151.95	3.80	1.526 0632	4472	87 26 12.93	92.24
.31	.497 7964	7294	85 49 02.69	150.44	.81	.526 5072	4428	87 27 44.71	91.32
.32	.498 5211	7221	85 51 32.36	148.95	.82	.526 9458	4384	87 29 15.58	90.42
.33	.499 2489	7150	85 54 00.50	147.47	.83	.527 3790	4340	87 30 45.55	89.52
.34	.499 9781	7079	85 56 27.32	146.00	.84	.527 8157	4297	87 32 14.62	88.63
3.35	1.500 6954	7008	85 58 52.60	144.56	3.85	1.528 2433	4254	87 33 42.80	87.75
.36	.501 3527	6939	86 01 16.34	143.12	.86	.528 6666	4212	87 35 10.11	86.87
.37	.502 0441	6870	86 03 38.81	141.70	.87	.529 0866	4170	87 36 36.55	86.01
.38	.502 7277	6802	86 05 59.84	140.29	.88	.529 5035	4128	87 38 02.13	85.15
.39	.503 4043	6734	86 08 19.44	138.90	.89	.529 9113	4087	87 39 26.86	84.31
3.40	1.504 0716	6667	86 10 37.65	137.52	3.90	1.530 3180	4047	87 40 50.75	83.47
.41	.504 7380	6601	86 12 54.48	136.16	.91	.530 7207	4007	87 42 13.81	82.64
.42	.505 3948	6536	86 15 09.96	134.80	.92	.531 1193	3967	87 43 36.03	81.82
.43	.506 0451	6471	86 17 24.10	133.47	.93	.531 5140	3927	87 44 57.45	81.00
.44	.506 6889	6406	86 19 36.90	132.14	.94	.531 9048	3888	87 46 18.05	80.20
3.45	1.507 3264	6343	86 21 48.38	130.83	3.95	1.532 2917	3850	87 47 37.85	79.40
.46	.507 9573	6280	86 23 58.56	129.53	.95	.532 6747	3811	87 48 56.85	78.61
.47	.508 5823	6217	86 25 07.44	128.24	.96	.533 0539	3773	87 50 15.07	77.83
.48	.509 2010	6156	86 26 15.05	126.97	.98	.533 4294	3736	87 51 32.54	77.06
.49	.509 8135	6095	86 28 21.39	125.71	.99	.533 8011	3699	87 52 49.19	76.29
3.50	1.510 4199	6034	86 32 26.47	124.46	4.00	1.534 1691	3662	87 54 05.10	75.53
u	2 tan ⁻¹ (u) =	= arch u	2 tan ⁻¹ (u) - 90° =	= arch u	u	2 tan ⁻¹ (u) =	= arch u	2 tan ⁻¹ (u) - 90° =	= arch u

The Gudermannian.

u	$\operatorname{gd} u$	$\operatorname{gd}' u$	$\operatorname{gd} u$	$\operatorname{gd}' u$	u	$\operatorname{gd} u$	$\operatorname{gd}' u$	$\operatorname{gd} u$	$\operatorname{gd}' u$
4.00	1.531 1691	2162	87 54 05.10	75.53	4.30	1.548 5792	2222	88 43 37.40	45.82
.01	1.531 5335	2163	87 55 20.20	74.78	.51	1.548 8003	2209	88 44 22.09	45.37
.02	1.531 8979	2164	87 56 35.69	74.04	.52	1.549 0192	2178	88 45 08.13	44.92
.03	1.531 3514	2154	87 57 48.31	73.30	.53	1.549 2358	2156	88 45 52.82	44.47
.04	1.531 6099	2148	87 59 01.07	72.57	.54	1.549 4593	2134	88 46 37.07	44.03
4.05	1.535 9351	2181	88 00 13.41	71.85	4.55	1.549 6627	2113	88 47 20.88	43.59
.06	1.536 2017	2129	88 01 23.02	71.14	.56	1.549 8730	2099	88 48 04.25	43.15
.07	1.536 6319	2115	88 02 35.76	70.43	.57	1.550 0811	2071	88 48 47.19	42.73
.08	1.536 9616	2104	88 03 45.83	69.73	.58	1.550 2873	2051	88 49 29.70	42.30
.09	1.537 3110	2137	88 04 55.23	69.03	.59	1.550 4943	2030	88 50 11.79	41.88
4.10	1.537 6910	2114	88 06 03.91	68.35	4.60	1.550 6933	2010	88 50 53.46	41.46
.11	1.537 9857	2131	88 07 11.01	67.67	.61	1.550 8833	1999	88 51 24.72	41.05
.12	1.538 3003	2138	88 08 19.25	67.00	.62	1.551 0711	1979	88 52 15.36	40.64
.13	1.538 6333	2130	88 09 25.09	66.33	.63	1.551 2594	1951	88 52 56.00	40.24
.14	1.538 9531	2111	88 10 31.01	65.67	.64	1.551 4818	1931	88 53 36.04	39.84
4.15	1.539 2701	2142	88 11 37.25	65.02	4.65	1.551 6737	1912	88 54 15.68	39.44
.16	1.539 5837	2131	88 12 41.94	64.37	.66	1.551 8630	1902	88 54 54.92	39.05
.17	1.539 9113	2099	88 13 45.99	63.73	.67	1.552 0523	1874	88 55 33.77	38.66
.18	1.540 2017	2093	88 14 49.08	63.10	.68	1.552 2388	1855	88 56 12.24	38.28
.19	1.540 5061	2092	88 15 52.19	62.47	.69	1.552 4215	1837	88 56 50.33	37.89
4.20	1.540 8023	2081	88 16 51.31	61.85	4.70	1.552 6053	1819	88 57 28.03	37.52
.21	1.541 0988	2079	88 17 55.18	61.23	.71	1.552 7893	1801	88 58 05.36	37.14
.22	1.541 3912	2070	88 18 59.81	60.62	.72	1.552 9743	1783	88 58 42.32	36.77
.23	1.541 6906	2060	88 19 57.13	60.02	.73	1.553 1618	1765	88 59 18.91	36.41
.24	1.541 9811	2051	88 20 59.85	59.42	.74	1.553 3495	1748	88 59 55.14	36.05
4.25	1.542 2743	2052	88 21 55.88	58.83	4.75	1.553 5334	1730	89 00 31.01	35.69
.26	1.542 5596	2052	88 22 51.51	58.25	.76	1.553 6655	1713	89 01 06.52	35.33
.27	1.542 8466	2066	88 23 51.48	57.67	.77	1.553 8360	1696	89 01 41.68	34.98
.28	1.543 1356	2065	88 24 49.70	57.09	.78	1.554 0017	1679	89 02 16.48	34.63
.29	1.543 4252	2044	88 25 46.69	56.53	.79	1.554 1718	1662	89 02 50.94	34.29
4.30	1.543 6969	2073	88 26 43.01	55.96	4.80	1.554 3374	1646	89 03 25.06	33.95
.31	1.543 9608	2069	88 27 38.60	55.41	.81	1.554 5010	1630	89 03 58.84	33.61
.32	1.544 2261	2060	88 28 33.73	54.86	.82	1.554 6634	1613	89 04 32.28	33.28
.33	1.544 4928	2053	88 29 28.31	54.31	.83	1.554 8236	1597	89 05 05.30	32.94
.34	1.544 7517	2067	88 30 22.35	53.77	.84	1.554 9823	1581	89 05 38.17	32.62
4.35	1.544 9811	2056	88 31 15.83	53.21	4.85	1.555 1399	1576	89 06 10.63	32.29
.36	1.545 2099	2055	88 32 08.82	52.71	.86	1.555 2957	1560	89 06 42.70	31.97
.37	1.545 4365	2050	88 33 01.37	52.23	.87	1.555 4499	1545	89 07 14.57	31.65
.38	1.545 7269	2046	88 33 53.10	51.69	.88	1.555 6026	1530	89 07 46.07	31.34
.39	1.545 9661	2050	88 34 44.20	51.15	.89	1.555 7538	1504	89 08 17.25	31.03
4.40	1.546 2130	2055	88 35 35.39	50.63	4.90	1.555 9034	1489	89 08 48.12	30.72
.41	1.546 4592	2041	88 36 25.88	50.14	.91	1.556 0516	1474	89 09 18.69	30.41
.42	1.546 7000	2047	88 37 15.79	49.63	.92	1.556 1983	1460	89 09 48.95	30.11
.43	1.546 9385	2053	88 38 05.13	49.14	.93	1.556 3436	1445	89 10 18.91	29.81
.44	1.547 1755	2059	88 38 54.05	48.65	.94	1.556 4874	1431	89 10 48.57	29.51
4.45	1.547 4101	2035	88 39 42.46	48.17	4.95	1.556 6297	1417	89 11 17.93	29.22
.46	1.547 6456	2032	88 40 30.30	47.69	.96	1.556 7707	1403	89 11 47.01	28.93
.47	1.547 8827	2050	88 41 17.88	47.22	.97	1.556 9093	1389	89 12 15.79	28.64
.48	1.548 1396	2066	88 42 04.83	46.75	.98	1.557 0484	1375	89 12 44.30	28.35
.49	1.548 3990	2044	88 42 51.35	46.28	.99	1.557 1852	1361	89 13 12.51	28.07
4.50	1.548 5799	2222	89 43 37.40	45.82	5.00	1.557 3206	1348	89 13 40.44	27.79
u	$2 \tan^{-1} u$	$\frac{\pi}{2}$	$2 \tan^{-1} u$	$\frac{\pi}{2}$	u	$2 \tan^{-1} u$	$\frac{\pi}{2}$	$2 \tan^{-1} u$	$\frac{\pi}{2}$

The Gudermannian.

u	gd u	uF'	gd u	uF'	u	gd u	uF'	gd u	uF'
5.00	1.557 3206	1348	89 15 40.44	27.70	5.30	1.562 6228	817	89 31 54.10	16.86
.01	.557 4547	1334	89 16 08.10	27.52	.51	.562 7012	809	89 32 10.87	16.69
.02	.557 5875	1321	89 16 35.45	27.34	.52	.562 7847	801	89 31 27.48	16.53
.03	.557 7189	1308	89 15 02.58	26.97	.53	.562 8644	793	89 32 43.02	16.36
.04	.557 8499	1295	89 15 29.42	26.71	.54	.562 9433	785	89 33 00.20	16.20
5.05	1.557 9778	1282	89 15 56.00	26.44	5.55	1.563 0215	777	89 33 16.32	16.04
.06	.558 1054	1269	89 16 22.30	26.18	.56	.563 0988	770	89 33 32.27	15.88
.07	.558 2317	1256	89 16 48.25	25.92	.57	.563 1754	762	89 33 48.07	15.72
.08	.558 3567	1244	89 17 14.14	25.66	.58	.563 2512	755	89 34 03.71	15.56
.09	.558 4804	1232	89 17 39.07	25.40	.59	.563 3263	747	89 34 19.20	15.41
5.10	1.558 6020	1220	89 18 04.94	25.15	5.60	1.563 4006	740	89 34 34.53	15.25
.11	.558 7243	1207	89 18 30.07	24.90	.61	.563 4742	732	89 34 49.71	15.10
.12	.558 8444	1195	89 18 54.74	24.65	.62	.563 5471	725	89 35 05.03	14.95
.13	.558 9633	1183	89 19 19.27	24.41	.63	.563 6192	718	89 35 19.64	14.80
.14	.559 0811	1172	89 19 43.50	24.16	.64	.563 6906	711	89 35 34.24	14.66
5.15	1.559 1976	1160	89 20 07.60	23.92	5.65	1.563 7613	703	89 35 48.93	14.51
.16	.559 3121	1148	89 20 31.40	23.69	.65	.563 8313	697	89 36 03.30	14.37
.17	.559 4273	1137	89 20 54.09	23.45	.66	.563 9006	690	89 36 17.60	14.22
.18	.559 5404	1126	89 21 16.31	23.22	.67	.563 9692	683	89 36 31.81	14.08
.19	.559 6524	1114	89 21 41.41	22.99	.68	.564 0372	676	89 36 45.84	13.94
5.20	1.559 7633	1103	89 22 04.28	22.76	5.70	1.564 1044	669	89 36 59.70	13.80
.21	.559 8731	1092	89 22 26.92	22.53	.71	.564 1710	663	89 37 13.43	13.67
.22	.559 9818	1081	89 22 49.34	22.31	.72	.564 2369	656	89 37 27.03	13.53
.23	.560 0894	1071	89 23 11.53	22.08	.73	.564 3022	649	89 37 40.40	13.40
.24	.560 1959	1060	89 23 33.58	21.86	.74	.564 3668	643	89 37 53.82	13.26
5.25	1.560 3014	1049	89 23 55.05	21.65	5.75	1.564 4308	637	89 38 07.01	13.13
.26	.560 4068	1039	89 24 16.80	21.43	.76	.564 4941	630	89 38 20.08	13.00
.27	.560 5092	1029	89 24 38.13	21.22	.77	.564 5568	624	89 38 33.01	12.87
.28	.560 6116	1018	89 24 59.34	21.01	.78	.564 6189	618	89 38 45.82	12.74
.29	.560 7129	1008	89 25 20.14	20.80	.79	.564 6804	612	89 38 58.50	12.61
5.30	1.560 8132	998	89 25 40.84	20.59	5.80	1.564 7412	606	89 39 11.05	12.49
.31	.560 9126	988	89 26 01.33	20.39	.81	.564 8015	599	89 39 23.48	12.37
.32	.561 0109	979	89 26 21.61	20.18	.82	.564 8611	594	89 39 35.78	12.24
.33	.561 1083	969	89 26 41.69	19.98	.83	.564 9202	588	89 39 47.96	12.12
.34	.561 2047	959	89 27 01.58	19.78	.84	.564 9787	583	89 40 00.02	12.00
5.35	1.561 3001	950	89 27 21.26	19.59	5.85	1.565 0365	576	89 40 11.66	11.88
.36	.561 3946	940	89 27 40.75	19.39	.85	.565 0939	570	89 40 23.71	11.76
.37	.561 4881	931	89 28 00.05	19.20	.86	.565 1508	565	89 40 35.48	11.65
.38	.561 5807	922	89 28 19.15	19.01	.87	.565 2072	559	89 40 47.07	11.53
.39	.561 6724	912	89 28 38.06	18.82	.88	.565 2634	553	89 40 58.54	11.41
5.40	1.561 7632	903	89 28 56.79	18.63	5.90	1.565 3195	548	89 41 09.90	11.30
.41	.561 8531	894	89 29 15.33	18.45	.91	.565 3750	542	89 41 21.15	11.19
.42	.561 9421	885	89 29 33.68	18.26	.92	.565 4300	537	89 41 32.28	11.08
.43	.562 0302	877	89 29 51.85	18.08	.93	.565 4844	532	89 41 43.30	10.97
.44	.562 1174	868	89 30 09.85	17.90	.94	.565 5383	526	89 41 54.21	10.86
5.45	1.562 2038	859	89 30 27.66	17.72	5.95	1.565 5917	521	89 42 05.03	10.75
.46	.562 2893	851	89 30 45.20	17.55	.96	.565 6450	516	89 42 15.71	10.64
.47	.562 3739	842	89 31 02.75	17.37	.97	.565 6982	511	89 42 26.30	10.54
.48	.562 4577	834	89 31 20.04	17.20	.98	.565 7507	506	89 42 36.79	10.43
.49	.562 5409	826	89 31 37.15	17.03	.99	.565 8026	501	89 42 47.17	10.33
5.50	1.562 6228	817	89 31 54.10	16.86	6.00	1.565 8538	496	89 42 57.44	10.23
u	$2 \tan^{-1} e^u - \frac{\pi}{2}$	= sech u	$2 \tan^{-1} e^u - 90^\circ$	= sech u	u	$2 \tan^{-1} e^u - \frac{\pi}{2}$	= sech u	$2 \tan^{-1} e^u - 90^\circ$	= sech u

TABLE VII

THE ANTI-GUDERMANNIAN

u expressed in minutes in terms of the Gudermannian,

$gd\ u$ expressed in degrees and minutes.

1 minute = 0.000 2908 8821 radians,

$$0.000\ 2908\ 8821\ u = \log_e \tan \left(\frac{1}{4} \cdot \pi + \frac{1}{2} \cdot gd\ u \right) = u \text{ radians.}$$

In this table the second decimal place is sometimes erroneous by a unit.

The Anti-Gudermannian.

sin	0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	sin
0°	0°00	50.00	120.00	180.00	240.00	300.00	360.00	420.00	480.00	540.00	600.00	0°
1	1.00	61.00	121.00	181.00	241.00	301.00	361.00	421.00	481.00	541.00	601.00	1
2	2.00	62.00	122.00	182.00	242.00	302.00	362.00	422.00	482.00	542.00	602.00	2
3	3.00	63.00	123.00	183.00	243.00	303.00	363.00	423.00	483.00	543.00	603.00	3
4	4.00	64.00	124.00	184.00	244.00	304.00	364.00	424.00	484.00	544.00	604.00	4
5	5.00	65.00	125.00	185.00	245.00	305.00	365.00	425.00	485.00	545.00	605.00	5
6	6.00	66.00	126.00	186.00	246.00	306.00	366.00	426.00	486.00	546.00	606.00	6
7	7.00	67.00	127.00	187.00	247.00	307.00	367.00	427.00	487.00	547.00	607.00	7
8	8.00	68.00	128.00	188.00	248.00	308.00	368.00	428.00	488.00	548.00	608.00	8
9	9.00	69.00	129.00	189.00	249.00	309.00	369.00	429.00	489.00	549.00	609.00	9
10	10.00	70.00	130.00	190.00	250.00	310.00	370.00	430.00	490.00	550.00	610.00	10
11	11.00	71.00	131.00	191.00	251.00	311.00	371.00	431.00	491.00	551.00	611.00	11
12	12.00	72.00	132.00	192.00	252.00	312.00	372.00	432.00	492.00	552.00	612.00	12
13	13.00	73.00	133.00	193.00	253.00	313.00	373.00	433.00	493.00	553.00	613.00	13
14	14.00	74.00	134.00	194.00	254.00	314.00	374.00	434.00	494.00	554.00	614.00	14
15	15.00	75.00	135.00	195.00	255.00	315.00	375.00	435.00	495.00	555.00	615.00	15
16	16.00	76.00	136.00	196.00	256.00	316.00	376.00	436.00	496.00	556.00	616.00	16
17	17.00	77.00	137.00	197.00	257.00	317.00	377.00	437.00	497.00	557.00	617.00	17
18	18.00	78.00	138.00	198.00	258.00	318.00	378.00	438.00	498.00	558.00	618.00	18
19	19.00	79.00	139.00	199.00	259.00	319.00	379.00	439.00	499.00	559.00	619.00	19
20	20.00	80.00	140.00	200.00	260.00	320.00	380.00	440.00	500.00	560.00	620.00	20
21	21.00	81.00	141.00	201.00	261.00	321.00	381.00	441.00	501.00	561.00	621.00	21
22	22.00	82.00	142.00	202.00	262.00	322.00	382.00	442.00	502.00	562.00	622.00	22
23	23.00	83.00	143.00	203.00	263.00	323.00	383.00	443.00	503.00	563.00	623.00	23
24	24.00	84.00	144.00	204.00	264.00	324.00	384.00	444.00	504.00	564.00	624.00	24
25	25.00	85.00	145.00	205.00	265.00	325.00	385.00	445.00	505.00	565.00	625.00	25
26	26.00	86.00	146.00	206.00	266.00	326.00	386.00	446.00	506.00	566.00	626.00	26
27	27.00	87.00	147.00	207.00	267.00	327.00	387.00	447.00	507.00	567.00	627.00	27
28	28.00	88.00	148.00	208.00	268.00	328.00	388.00	448.00	508.00	568.00	628.00	28
29	29.00	89.00	149.00	209.00	269.00	329.00	389.00	449.00	509.00	569.00	629.00	29
30	30.00	90.00	150.00	210.00	270.00	330.00	390.00	450.00	510.00	570.00	630.00	30
31	31.00	91.00	151.00	211.00	271.00	331.00	391.00	451.00	511.00	571.00	631.00	31
32	32.00	92.00	152.00	212.00	272.00	332.00	392.00	452.00	512.00	572.00	632.00	32
33	33.00	93.00	153.00	213.00	273.00	333.00	393.00	453.00	513.00	573.00	633.00	33
34	34.00	94.00	154.00	214.00	274.00	334.00	394.00	454.00	514.00	574.00	634.00	34
35	35.00	95.00	155.00	215.00	275.00	335.00	395.00	455.00	515.00	575.00	635.00	35
36	36.00	96.00	156.00	216.00	276.00	336.00	396.00	456.00	516.00	576.00	636.00	36
37	37.00	97.00	157.00	217.00	277.00	337.00	397.00	457.00	517.00	577.00	637.00	37
38	38.00	98.00	158.00	218.00	278.00	338.00	398.00	458.00	518.00	578.00	638.00	38
39	39.00	99.00	159.00	219.00	279.00	339.00	399.00	459.00	519.00	579.00	639.00	39
40	40.00	100.00	160.00	220.00	280.00	340.00	400.00	460.00	520.00	580.00	640.00	40
41	41.00	101.00	161.00	221.00	281.00	341.00	401.00	461.00	521.00	581.00	641.00	41
42	42.00	102.00	162.00	222.00	282.00	342.00	402.00	462.00	522.00	582.00	642.00	42
43	43.00	103.00	163.00	223.00	283.00	343.00	403.00	463.00	523.00	583.00	643.00	43
44	44.00	104.00	164.00	224.00	284.00	344.00	404.00	464.00	524.00	584.00	644.00	44
45	45.00	105.00	165.00	225.00	285.00	345.00	405.00	465.00	525.00	585.00	645.00	45
46	46.00	106.00	166.00	226.00	286.00	346.00	406.00	466.00	526.00	586.00	646.00	46
47	47.00	107.00	167.00	227.00	287.00	347.00	407.00	467.00	527.00	587.00	647.00	47
48	48.00	108.00	168.00	228.00	288.00	348.00	408.00	468.00	528.00	588.00	648.00	48
49	49.00	109.00	169.00	229.00	289.00	349.00	409.00	469.00	529.00	589.00	649.00	49
50	50.00	110.00	170.00	230.00	290.00	350.00	410.00	470.00	530.00	590.00	650.00	50
51	51.00	111.00	171.00	231.00	291.00	351.00	411.00	471.00	531.00	591.00	651.00	51
52	52.00	112.00	172.00	232.00	292.00	352.00	412.00	472.00	532.00	592.00	652.00	52
53	53.00	113.00	173.00	233.00	293.00	353.00	413.00	473.00	533.00	593.00	653.00	53
54	54.00	114.00	174.00	234.00	294.00	354.00	414.00	474.00	534.00	594.00	654.00	54
55	55.00	115.00	175.00	235.00	295.00	355.00	415.00	475.00	535.00	595.00	655.00	55
56	56.00	116.00	176.00	236.00	296.00	356.00	416.00	476.00	536.00	596.00	656.00	56
57	57.00	117.00	177.00	237.00	297.00	357.00	417.00	477.00	537.00	597.00	657.00	57
58	58.00	118.00	178.00	238.00	298.00	358.00	418.00	478.00	538.00	598.00	658.00	58
59	59.00	119.00	179.00	239.00	299.00	359.00	419.00	479.00	539.00	599.00	659.00	59
60	60.00	120.00	180.00	240.00	300.00	360.00	420.00	480.00	540.00	600.00	660.00	60

MIN TABLE

The Anti-Gudermannian.

14°	14°	12°	13°	14°	15°	16°	17°	18°	19°	20°	15°
0	664.09	745.32	786.78	828.49	870.46	912.73	955.35	998.22	1041.40	1085.14	0
1	665.11	746.34	787.81	829.52	871.49	913.80	956.45	999.37	1042.60	1086.34	1
2	666.13	747.37	788.83	830.55	872.51	914.81	957.47	1000.44	1043.74	1087.57	2
3	667.15	748.39	789.85	831.58	873.52	915.82	958.49	1001.51	1044.88	1088.80	3
4	668.17	749.41	790.88	832.61	874.54	916.83	959.51	1002.58	1046.02	1089.99	4
5	669.19	750.43	791.91	833.64	875.56	917.84	960.53	1003.65	1047.16	1091.18	5
6	670.21	751.45	792.94	834.67	876.57	918.85	961.55	1004.72	1048.30	1092.37	6
7	671.22	752.48	793.97	835.70	877.59	919.86	962.57	1005.79	1049.44	1093.56	7
8	672.24	753.50	794.99	836.73	878.60	920.87	963.59	1006.86	1050.58	1094.75	8
9	673.26	754.53	796.02	837.75	879.61	921.88	964.61	1007.93	1051.72	1095.94	9
10	674.28	755.55	797.04	838.78	880.62	922.89	965.63	1009.00	1052.86	1097.13	10
11	675.30	756.57	798.07	839.81	881.63	923.90	966.65	1010.07	1054.00	1098.32	11
12	676.32	757.59	799.10	840.83	882.64	924.91	967.67	1011.14	1055.14	1099.51	12
13	677.34	758.62	800.13	841.85	883.65	925.92	968.69	1012.21	1056.28	1100.70	13
14	678.36	759.64	801.15	842.88	884.66	926.93	969.71	1013.28	1057.42	1101.89	14
15	679.38	760.67	802.18	843.90	885.67	927.94	970.73	1014.35	1058.56	1103.08	15
16	680.40	761.69	803.21	844.93	886.68	928.95	971.75	1015.42	1059.70	1104.27	16
17	681.42	762.71	804.23	845.95	887.69	929.96	972.77	1016.49	1060.84	1105.46	17
18	682.44	763.73	805.26	846.98	888.70	930.97	973.79	1017.56	1061.98	1106.65	18
19	683.46	764.75	806.28	848.00	889.71	931.98	974.81	1018.63	1063.12	1107.84	19
20	684.48	765.78	807.31	849.03	890.72	932.99	975.83	1019.70	1064.26	1109.03	20
21	685.50	766.80	808.33	850.05	891.73	934.00	976.85	1020.77	1065.40	1110.22	21
22	686.52	767.82	809.36	851.08	892.74	935.01	977.87	1021.84	1066.54	1111.41	22
23	687.54	768.85	810.39	852.10	893.75	936.02	978.89	1022.91	1067.68	1112.60	23
24	688.56	769.87	811.42	853.13	894.76	937.03	979.91	1024.00	1068.82	1113.79	24
25	689.58	770.90	812.45	854.15	895.77	938.04	980.93	1025.07	1069.96	1114.98	25
26	690.60	771.92	813.48	855.18	896.78	939.05	981.95	1026.14	1071.10	1116.17	26
27	691.62	772.95	814.51	856.20	897.79	940.06	982.97	1027.21	1072.24	1117.36	27
28	692.64	773.97	815.54	857.23	898.80	941.07	983.99	1028.28	1073.38	1118.55	28
29	693.66	775.00	816.57	858.25	899.81	942.08	985.01	1029.35	1074.52	1119.74	29
30	694.68	776.02	817.60	859.28	900.82	943.09	986.03	1030.42	1075.66	1120.93	30
31	695.70	777.05	818.63	860.31	901.83	944.10	987.05	1031.49	1076.80	1122.12	31
32	696.72	778.07	819.66	861.34	902.84	945.11	988.07	1032.56	1077.94	1123.31	32
33	697.74	779.10	820.69	862.37	903.85	946.12	989.09	1033.63	1079.08	1124.50	33
34	698.76	780.12	821.72	863.40	904.86	947.13	990.11	1034.70	1080.22	1125.69	34
35	699.78	781.15	822.75	864.43	905.87	948.14	991.13	1035.77	1081.36	1126.88	35
36	700.80	782.17	823.78	865.46	906.88	949.15	992.15	1036.84	1082.50	1128.07	36
37	701.82	783.20	824.81	866.49	907.89	950.16	993.17	1037.91	1083.64	1129.26	37
38	702.84	784.22	825.84	867.52	908.90	951.17	994.19	1038.98	1084.78	1130.45	38
39	703.86	785.25	826.87	868.55	909.91	952.18	995.21	1040.05	1085.92	1131.64	39
40	704.88	786.27	827.90	869.58	910.92	953.19	996.23	1041.12	1087.06	1132.83	40
41	705.90	787.30	828.93	870.61	911.93	954.20	997.25	1042.19	1088.20	1134.02	41
42	706.92	788.32	829.96	871.64	912.94	955.21	998.27	1043.26	1089.34	1135.21	42
43	707.94	789.35	830.99	872.67	913.95	956.22	999.29	1044.33	1090.48	1136.40	43
44	708.96	790.37	832.02	873.70	914.96	957.23	1000.31	1045.40	1091.62	1137.59	44
45	709.98	791.40	833.05	874.73	915.97	958.24	1001.33	1046.47	1092.76	1138.78	45
46	710.99	792.42	834.08	875.76	916.98	959.25	1002.35	1047.54	1093.90	1139.97	46
47	712.01	793.45	835.11	876.79	917.99	960.26	1003.37	1048.61	1095.04	1141.16	47
48	713.03	794.47	836.14	877.82	918.99	961.27	1004.39	1049.68	1096.18	1142.35	48
49	714.05	795.50	837.17	878.85	919.99	962.28	1005.41	1050.75	1097.32	1143.54	49
50	715.07	796.52	838.20	879.88	920.99	963.29	1006.43	1051.82	1098.46	1144.73	50
51	716.09	797.55	839.23	880.91	921.99	964.30	1007.45	1052.89	1099.60	1145.92	51
52	717.11	798.57	840.26	881.94	922.99	965.31	1008.47	1053.96	1100.74	1147.11	52
53	718.13	799.60	841.29	882.97	923.99	966.32	1009.49	1055.03	1101.88	1148.30	53
54	719.15	800.62	842.32	884.00	924.99	967.33	1010.51	1056.10	1103.02	1149.49	54
55	720.17	801.65	843.35	885.03	925.99	968.34	1011.53	1057.17	1104.16	1150.68	55
56	721.19	802.67	844.38	886.06	926.99	969.35	1012.55	1058.24	1105.30	1151.87	56
57	722.21	803.70	845.41	887.09	927.99	970.36	1013.57	1059.31	1106.44	1153.06	57
58	723.23	804.72	846.44	888.12	928.99	971.37	1014.59	1060.38	1107.58	1154.25	58
59	724.25	805.75	847.47	889.15	929.99	972.38	1015.61	1061.45	1108.72	1155.44	59
60	725.27	806.77	848.50	890.18	930.99	973.39	1016.63	1062.52	1109.86	1156.63	60

The Anti-Guderianism.

0	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	16°	17°	18°	19°	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°	30°	31°	32°	33°	34°	35°	36°	37°	38°	39°	40°	41°	42°	43°	44°	45°	46°	47°	48°	49°	50°	51°	52°	53°	54°	55°	56°	57°	58°	59°	60°																																																																																																																																																																																																																																																																			
0	1289.20	1283.69	1278.03	1272.23	1266.30	1260.25	1254.08	1247.79	1241.38	1234.85	1228.20	1221.43	1214.54	1207.53	1200.40	1193.14	1185.75	1178.23	1170.58	1162.80	1154.89	1146.85	1138.68	1130.38	1121.95	1113.39	1104.70	1095.88	1086.93	1077.85	1068.64	1059.31	1049.85	1040.26	1030.54	1020.69	1010.71	1000.61	990.38	979.92	969.24	958.35	947.25	935.94	924.42	912.69	900.75	888.60	876.24	863.67	850.89	837.90	824.71	811.32	797.73	783.94	769.95	755.76	741.37	726.78	712.00	697.02	681.84	666.46	650.89	635.13	619.17	603.01	586.65	570.09	553.33	536.37	519.21	501.85	484.29	466.53	448.57	430.41	412.05	393.49	374.73	355.77	336.61	317.25	297.69	277.93	257.97	237.81	217.45	196.89	176.13	155.17	134.01	112.65	91.09	69.33	47.37	25.11	2.65	-19.11	-40.05	-60.29	-80.83	-101.67	-122.81	-144.25	-165.99	-187.93	-209.17	-230.71	-252.55	-274.69	-297.13	-319.87	-342.91	-366.25	-389.89	-413.83	-438.07	-462.61	-487.45	-512.59	-537.93	-563.57	-589.51	-615.75	-642.29	-669.13	-696.27	-723.71	-751.45	-779.39	-807.53	-835.87	-864.41	-893.15	-922.09	-951.23	-980.57	-1010.11	-1039.85	-1069.79	-1099.93	-1130.27	-1160.81	-1191.55	-1222.49	-1253.63	-1284.97	-1316.51	-1348.25	-1380.19	-1412.33	-1444.67	-1477.21	-1509.95	-1542.89	-1576.03	-1609.37	-1642.91	-1676.65	-1710.59	-1744.73	-1779.07	-1813.61	-1848.35	-1883.29	-1918.43	-1953.77	-1989.31	-2025.05	-2060.99	-2097.13	-2133.47	-2169.91	-2206.55	-2243.39	-2280.43	-2317.67	-2355.11	-2392.75	-2430.59	-2468.63	-2506.87	-2545.31	-2583.95	-2622.79	-2661.83	-2701.07	-2740.51	-2780.15	-2819.99	-2859.93	-2900.07	-2940.41	-2980.95	-3021.69	-3062.63	-3103.77	-3145.11	-3186.65	-3228.39	-3270.33	-3312.57	-3355.01	-3397.65	-3440.49	-3483.53	-3526.77	-3570.21	-3613.85	-3657.69	-3701.73	-3745.97	-3790.41	-3835.05	-3879.89	-3924.93	-3970.17	-4015.61	-4061.25	-4107.09	-4153.13	-4199.37	-4245.81	-4292.45	-4339.29	-4386.33	-4433.57	-4480.91	-4528.45	-4576.19	-4624.13	-4672.27	-4720.61	-4769.15	-4817.89	-4866.83	-4915.97	-4965.31	-5014.85	-5064.59	-5114.53	-5164.67	-5214.91	-5265.35	-5315.99	-5366.83	-5417.87	-5469.11	-5520.55	-5572.19	-5623.93	-5675.87	-5727.91	-5780.15	-5832.59	-5885.23	-5938.07	-5991.11	-6044.35	-6097.79	-6151.43	-6205.27	-6259.31	-6313.55	-6367.99	-6422.63	-6477.47	-6532.51	-6587.75	-6643.19	-6698.83	-6754.67	-6810.71	-6866.95	-6923.39	-6979.93	-7036.67	-7093.61	-7150.75	-7208.09	-7265.63	-7323.37	-7381.31	-7439.45	-7497.79	-7556.33	-7615.07	-7673.91	-7732.95	-7792.19	-7851.63	-7911.27	-7971.11	-8031.15	-8091.39	-8151.83	-8212.47	-8273.31	-8334.35	-8395.59	-8456.93	-8518.47	-8580.21	-8642.15	-8704.29	-8766.63	-8829.17	-8891.91	-8954.85	-9017.99	-9081.33	-9144.87	-9208.61	-9272.55	-9336.69	-9400.93	-9465.37

The Anti-Gudermannian.

of	31°	32°	33°	34°	35°	36°	37°	38°	39°	40°	of
0	0057.01	0058.08	0059.53	0101.48	0103.49	0105.49	0107.46	0109.36	0111.20	0112.99	0
1	0059.18	0060.36	0062.72	0065.09	0067.41	0069.64	0071.81	0073.91	0075.94	0077.90	1
2	0061.45	0062.74	0065.19	0067.53	0069.81	0072.04	0074.21	0076.31	0078.34	0080.30	2
3	0063.81	0065.20	0067.73	0070.15	0072.51	0074.81	0077.04	0079.21	0081.31	0083.34	3
4	0066.16	0067.65	0070.26	0072.81	0075.31	0077.74	0080.11	0082.41	0084.64	0086.80	4
5	0068.50	0070.08	0072.76	0075.39	0077.96	0080.46	0082.91	0085.31	0087.64	0089.90	5
6	0070.83	0072.50	0075.21	0077.86	0080.46	0083.01	0085.51	0087.96	0090.34	0092.64	6
7	0073.15	0074.91	0077.66	0080.34	0083.01	0085.61	0088.16	0090.64	0093.04	0095.34	7
8	0075.46	0077.31	0080.10	0082.81	0085.46	0088.11	0090.71	0093.26	0095.74	0098.14	8
9	0077.76	0079.70	0082.53	0085.31	0088.04	0090.71	0093.34	0095.91	0098.44	0100.90	9
10	0080.05	0082.07	0085.04	0087.96	0090.81	0093.64	0096.41	0099.14	0101.84	0104.49	10
11	0082.33	0084.43	0087.50	0090.51	0093.46	0096.34	0099.16	0101.91	0104.59	0107.20	11
12	0084.60	0086.78	0089.93	0093.04	0096.09	0099.06	0102.01	0104.91	0107.74	0110.50	12
13	0086.86	0089.12	0092.34	0095.51	0098.61	0101.64	0104.61	0107.54	0110.41	0113.20	13
14	0089.11	0091.45	0094.73	0098.01	0101.24	0104.41	0107.54	0110.61	0113.64	0116.60	14
15	0091.35	0093.76	0097.10	0100.39	0103.61	0106.74	0109.81	0112.84	0115.81	0118.70	15
16	0093.58	0096.06	0099.46	0102.81	0106.09	0109.34	0112.54	0115.69	0118.79	0121.84	16
17	0095.80	0098.35	0101.81	0105.19	0108.46	0111.69	0114.84	0117.94	0120.99	0123.99	17
18	0098.01	0100.63	0104.16	0107.59	0110.91	0114.14	0117.31	0120.44	0123.54	0126.59	18
19	0100.21	0102.90	0106.49	0109.99	0113.39	0116.69	0119.89	0123.04	0126.14	0129.19	19
20	0102.40	0105.16	0108.79	0112.31	0115.74	0119.06	0122.34	0125.54	0128.69	0131.79	20
21	0104.58	0107.41	0111.09	0114.61	0118.04	0121.36	0124.64	0127.84	0130.99	0134.09	21
22	0106.75	0109.64	0113.36	0116.91	0120.34	0123.66	0126.94	0130.14	0133.29	0136.39	22
23	0108.91	0111.85	0115.61	0119.19	0122.61	0125.94	0129.19	0132.39	0135.54	0138.64	23
24	0111.06	0114.05	0117.84	0121.46	0124.99	0128.41	0131.79	0135.09	0138.29	0141.44	24
25	0113.20	0116.24	0120.06	0123.69	0127.21	0130.64	0133.99	0137.24	0140.44	0143.59	25
26	0115.33	0118.42	0122.28	0125.91	0129.44	0132.86	0136.19	0139.44	0142.64	0145.79	26
27	0117.45	0120.59	0124.49	0128.14	0131.66	0135.09	0138.41	0141.66	0144.84	0147.99	27
28	0119.56	0122.75	0126.69	0130.34	0133.86	0137.29	0140.61	0143.84	0147.04	0150.19	28
29	0121.66	0124.90	0128.86	0132.51	0136.04	0139.46	0142.79	0146.04	0149.24	0152.39	29
30	0123.75	0127.04	0131.04	0134.69	0138.21	0141.64	0145.04	0148.34	0151.59	0154.79	30
31	0125.83	0129.16	0133.21	0136.86	0140.39	0143.81	0147.14	0150.44	0153.64	0156.79	31
32	0127.90	0131.27	0135.36	0139.01	0142.54	0146.04	0149.46	0152.79	0156.04	0159.19	32
33	0129.96	0133.37	0137.50	0141.19	0144.71	0148.14	0151.54	0154.89	0158.14	0161.29	33
34	0132.01	0135.46	0139.64	0143.39	0146.91	0150.34	0153.74	0157.04	0160.29	0163.44	34
35	0134.05	0137.54	0141.76	0145.51	0149.04	0152.46	0155.84	0159.14	0162.39	0165.54	35
36	0136.08	0139.61	0143.86	0147.61	0151.14	0154.56	0157.94	0161.24	0164.49	0167.64	36
37	0138.10	0141.67	0145.96	0149.71	0153.24	0156.66	0160.04	0163.34	0166.59	0169.74	37
38	0140.11	0143.72	0148.04	0151.81	0155.34	0158.76	0162.14	0165.44	0168.69	0171.84	38
39	0142.11	0145.76	0150.10	0153.91	0157.44	0160.86	0164.24	0167.54	0170.79	0173.94	39
40	0144.10	0147.79	0152.16	0156.01	0159.54	0163.04	0166.46	0169.84	0173.14	0176.34	40
41	0146.08	0149.81	0154.20	0158.09	0161.64	0165.06	0168.44	0171.79	0175.04	0178.24	41
42	0148.05	0151.82	0156.24	0160.19	0163.74	0167.16	0170.54	0173.89	0177.14	0180.34	42
43	0150.01	0153.82	0158.28	0162.29	0165.84	0169.26	0172.64	0175.99	0179.24	0182.44	43
44	0151.96	0155.81	0160.30	0164.39	0167.94	0171.36	0174.74	0178.04	0181.29	0184.44	44
45	0153.90	0157.79	0162.32	0166.41	0170.04	0173.46	0176.84	0180.14	0183.39	0186.54	45
46	0155.83	0159.76	0164.32	0168.49	0172.14	0175.56	0178.94	0182.24	0185.49	0188.64	46
47	0157.75	0161.72	0166.36	0170.59	0174.24	0177.66	0181.04	0184.34	0187.59	0190.74	47
48	0159.66	0163.67	0168.34	0172.61	0176.24	0179.66	0183.04	0186.34	0189.59	0192.74	48
49	0161.56	0165.61	0170.30	0174.61	0178.24	0181.66	0185.04	0188.34	0191.59	0194.74	49
50	0163.45	0167.54	0172.26	0176.61	0180.24	0183.66	0187.04	0190.34	0193.59	0196.74	50
51	0165.33	0169.46	0174.20	0178.59	0182.24	0185.66	0189.04	0192.34	0195.59	0198.74	51
52	0167.20	0171.36	0176.12	0180.59	0184.24	0187.66	0191.04	0194.34	0197.59	0200.74	52
53	0169.06	0173.25	0178.03	0182.59	0186.24	0189.66	0193.04	0196.34	0199.59	0202.74	53
54	0170.91	0175.13	0179.93	0184.59	0188.24	0191.66	0195.04	0198.34	0201.59	0204.74	54
55	0172.75	0176.99	0181.81	0186.59	0190.24	0193.66	0197.04	0200.34	0203.59	0206.74	55
56	0174.58	0178.85	0183.69	0188.59	0192.24	0195.66	0199.04	0202.34	0205.59	0208.74	56
57	0176.40	0180.69	0185.55	0190.59	0194.24	0197.66	0201.04	0204.34	0207.59	0210.74	57
58	0178.21	0182.52	0187.39	0192.59	0196.24	0199.66	0203.04	0206.34	0209.59	0212.74	58
59	0180.01	0184.34	0189.22	0194.59	0198.24	0201.66	0205.04	0208.34	0211.59	0214.74	59
60	0181.80	0186.15	0191.05	0196.59	0200.24	0203.66	0207.04	0210.34	0213.59	0216.74	60

The Anti-Gudermannian.

deg	41"	42"	43"	44"	45"	46"	47"	48"	49"	50"	deg
0	2701.60	2781.71	2863.30	2945.84	3029.01	3113.55	3200.21	3288.53	3378.03	3478.47	0
1	2702.04	2782.06	2863.65	2946.19	3029.36	3113.90	3200.56	3288.98	3378.48	3478.91	1
2	2702.48	2782.49	2864.09	2946.63	3029.77	3114.31	3200.97	3289.39	3378.89	3479.32	2
3	2702.92	2782.93	2864.53	2947.07	3030.18	3114.71	3201.38	3289.80	3379.30	3479.73	3
4	2703.36	2783.37	2864.97	2947.51	3030.59	3115.12	3201.79	3290.21	3379.71	3480.14	4
5	2703.80	2783.81	2865.41	2947.95	3031.00	3115.53	3202.20	3290.62	3380.12	3480.55	5
6	2704.24	2784.25	2865.85	2948.39	3031.41	3115.94	3202.61	3291.03	3380.53	3480.96	6
7	2704.68	2784.69	2866.29	2948.83	3031.82	3116.35	3203.02	3291.44	3380.94	3481.37	7
8	2705.12	2785.13	2866.73	2949.27	3032.23	3116.76	3203.43	3291.85	3381.35	3481.78	8
9	2705.56	2785.57	2867.17	2949.71	3032.64	3117.17	3203.84	3292.26	3381.76	3482.19	9
10	2706.00	2786.01	2867.61	2950.15	3033.05	3117.58	3204.25	3292.67	3382.17	3482.60	10
11	2706.44	2786.45	2868.05	2950.59	3033.46	3117.99	3204.66	3293.08	3382.58	3483.01	11
12	2706.88	2786.89	2868.49	2951.03	3033.87	3118.40	3205.07	3293.49	3382.99	3483.42	12
13	2707.32	2787.33	2868.93	2951.47	3034.28	3118.81	3205.48	3293.90	3383.40	3483.83	13
14	2707.76	2787.77	2869.37	2951.91	3034.69	3119.22	3205.89	3294.31	3383.81	3484.24	14
15	2708.20	2788.21	2869.81	2952.35	3035.10	3119.63	3206.30	3294.72	3384.22	3484.65	15
16	2708.64	2788.65	2870.25	2952.79	3035.51	3120.04	3206.71	3295.13	3384.63	3485.06	16
17	2709.08	2789.09	2870.69	2953.23	3035.92	3120.45	3207.12	3295.54	3385.04	3485.47	17
18	2709.52	2789.53	2871.13	2953.67	3036.33	3120.86	3207.53	3295.95	3385.45	3485.88	18
19	2710.00	2790.01	2871.57	2954.11	3036.74	3121.27	3207.94	3296.36	3385.86	3486.29	19
20	2710.44	2790.45	2872.01	2954.55	3037.15	3121.68	3208.35	3296.77	3386.27	3486.70	20
21	2710.88	2790.89	2872.45	2954.99	3037.56	3122.09	3208.76	3297.18	3386.68	3487.11	21
22	2711.32	2791.33	2872.89	2955.43	3037.97	3122.50	3209.17	3297.59	3387.09	3487.52	22
23	2711.76	2791.77	2873.33	2955.87	3038.38	3122.91	3209.58	3298.00	3387.50	3487.93	23
24	2712.20	2792.21	2873.77	2956.31	3038.79	3123.32	3210.00	3298.41	3387.91	3488.34	24
25	2712.64	2792.65	2874.21	2956.75	3039.20	3123.73	3210.41	3298.82	3388.32	3488.75	25
26	2713.08	2793.09	2874.65	2957.19	3039.61	3124.14	3210.82	3299.23	3388.73	3489.16	26
27	2713.52	2793.53	2875.09	2957.63	3040.02	3124.55	3211.23	3299.64	3389.14	3489.57	27
28	2713.96	2793.97	2875.53	2958.07	3040.43	3124.96	3211.64	3300.05	3389.55	3490.00	28
29	2714.40	2794.41	2875.97	2958.51	3040.84	3125.37	3212.05	3300.46	3389.96	3490.41	29
30	2714.84	2794.85	2876.41	2958.95	3041.25	3125.78	3212.46	3300.87	3390.37	3490.82	30
31	2715.28	2795.29	2876.85	2959.39	3041.66	3126.19	3212.87	3301.28	3390.78	3491.23	31
32	2715.72	2795.73	2877.29	2959.83	3042.07	3126.60	3213.28	3301.69	3391.19	3491.64	32
33	2716.16	2796.17	2877.73	2960.27	3042.48	3127.01	3213.69	3302.10	3391.60	3492.05	33
34	2716.60	2796.61	2878.17	2960.71	3042.89	3127.42	3214.10	3302.51	3392.01	3492.46	34
35	2717.04	2797.05	2878.61	2961.15	3043.30	3127.83	3214.51	3302.92	3392.42	3492.87	35
36	2717.48	2797.49	2879.05	2961.59	3043.71	3128.24	3214.92	3303.33	3392.83	3493.28	36
37	2717.92	2797.93	2879.49	2962.03	3044.12	3128.65	3215.33	3303.74	3393.24	3493.69	37
38	2718.36	2798.37	2879.93	2962.47	3044.53	3129.06	3215.74	3304.15	3393.65	3494.10	38
39	2718.80	2798.81	2880.37	2962.91	3044.94	3129.47	3216.15	3304.56	3394.06	3494.51	39
40	2719.24	2799.25	2880.81	2963.35	3045.35	3129.88	3216.56	3304.97	3394.47	3494.92	40
41	2719.68	2799.69	2881.25	2963.79	3045.76	3130.29	3216.97	3305.38	3394.88	3495.33	41
42	2720.12	2800.13	2881.69	2964.23	3046.17	3130.70	3217.38	3305.79	3395.29	3495.74	42
43	2720.56	2800.57	2882.13	2964.67	3046.58	3131.11	3217.79	3306.20	3395.70	3496.15	43
44	2721.00	2801.01	2882.57	2965.11	3046.99	3131.52	3218.20	3306.61	3396.11	3496.56	44
45	2721.44	2801.45	2883.01	2965.55	3047.40	3131.93	3218.61	3307.02	3396.52	3496.97	45
46	2721.88	2801.89	2883.45	2965.99	3047.81	3132.34	3219.02	3307.43	3396.93	3497.38	46
47	2722.32	2802.33	2883.89	2966.43	3048.22	3132.75	3219.43	3307.84	3397.34	3497.79	47
48	2722.76	2802.77	2884.33	2966.87	3048.63	3133.16	3219.84	3308.25	3397.75	3498.20	48
49	2723.20	2803.21	2884.77	2967.31	3049.04	3133.57	3220.25	3308.66	3398.16	3498.61	49
50	2723.64	2803.65	2885.21	2967.75	3049.45	3133.98	3220.66	3309.07	3398.57	3499.02	50
51	2724.08	2804.09	2885.65	2968.19	3049.86	3134.39	3221.07	3309.48	3398.98	3499.43	51
52	2724.52	2804.53	2886.09	2968.63	3050.27	3134.80	3221.48	3309.89	3399.39	3499.84	52
53	2724.96	2804.97	2886.53	2969.07	3050.68	3135.21	3221.89	3310.30	3399.80	3500.25	53
54	2725.40	2805.41	2886.97	2969.51	3051.09	3135.62	3222.30	3310.71	3400.21	3500.66	54
55	2725.84	2805.85	2887.41	2969.95	3051.50	3136.03	3222.71	3311.12	3400.62	3501.07	55
56	2726.28	2806.29	2887.85	2970.39	3051.91	3136.44	3223.12	3311.53	3401.03	3501.48	56
57	2726.72	2806.73	2888.29	2970.83	3052.32	3136.85	3223.53	3311.94	3401.44	3501.89	57
58	2727.16	2807.17	2888.73	2971.27	3052.73	3137.26	3223.94	3312.35	3401.85	3502.30	58
59	2727.60	2807.61	2889.17	2971.71	3053.14	3137.67	3224.35	3312.76	3402.26	3502.71	59
60	2728.04	2808.05	2889.61	2972.15	3053.55	3138.08	3224.76	3313.17	3402.67	3503.12	60

The Anti-Gudermansian

44°	51°	52°	53°	54°	55°	56°	57°	58°	59°	60°	61°
1	4578.31	4585.19	4592.29	4599.41	4606.57	4613.76	4620.98	4628.22	4635.48	4642.76	4650.05
2	4580.40	4587.32	4594.47	4601.64	4608.84	4616.07	4623.32	4630.59	4637.87	4645.16	4652.46
3	4582.49	4589.44	4596.62	4603.82	4611.05	4618.30	4625.57	4632.85	4640.14	4647.44	4654.74
4	4584.58	4591.56	4598.78	4605.99	4613.23	4620.49	4627.76	4635.04	4642.32	4649.61	4656.90
5	4586.67	4593.68	4600.93	4608.16	4615.42	4622.69	4629.97	4637.25	4644.53	4651.81	4659.10
6	4588.76	4595.79	4603.07	4610.28	4617.52	4624.78	4632.04	4639.31	4646.58	4653.85	4661.12
7	4590.85	4597.90	4605.20	4612.43	4619.68	4626.94	4634.20	4641.47	4648.73	4656.00	4663.26
8	4592.94	4599.99	4607.31	4614.55	4621.81	4629.08	4636.34	4643.61	4650.87	4658.13	4665.40
9	4595.03	4602.09	4609.43	4616.68	4623.94	4631.21	4638.47	4645.74	4652.99	4660.26	4667.52
10	4597.12	4604.19	4611.55	4618.81	4626.08	4633.35	4640.62	4647.89	4655.15	4662.42	4669.69
11	4599.21	4606.29	4613.67	4620.94	4628.21	4635.48	4642.75	4650.02	4657.29	4664.55	4671.82
12	4601.30	4608.39	4615.78	4623.05	4630.32	4637.59	4644.86	4652.13	4659.40	4666.67	4673.94
13	4603.39	4610.49	4617.89	4625.16	4632.43	4639.70	4646.97	4654.24	4661.51	4668.78	4676.05
14	4605.48	4612.59	4620.00	4627.27	4634.54	4641.81	4649.08	4656.35	4663.62	4670.89	4678.16
15	4607.57	4614.69	4622.11	4629.38	4636.65	4643.92	4651.19	4658.46	4665.73	4673.00	4680.27
16	4609.66	4616.79	4624.22	4631.49	4638.76	4646.03	4653.30	4660.57	4667.84	4675.11	4682.38
17	4611.75	4618.89	4626.33	4633.60	4640.87	4648.14	4655.41	4662.68	4669.95	4677.22	4684.49
18	4613.84	4620.99	4628.44	4635.71	4642.98	4650.25	4657.52	4664.79	4672.06	4679.33	4686.60
19	4615.93	4623.09	4630.55	4637.82	4645.09	4652.36	4659.63	4666.90	4674.17	4681.44	4688.71
20	4618.02	4625.19	4632.66	4639.93	4647.20	4654.47	4661.74	4669.01	4676.28	4683.55	4690.82
21	4620.11	4627.29	4634.77	4642.04	4649.31	4656.58	4663.85	4671.12	4678.39	4685.66	4692.93
22	4622.20	4629.39	4636.87	4644.14	4651.41	4658.68	4665.95	4673.22	4680.49	4687.76	4695.03
23	4624.29	4631.49	4639.07	4646.34	4653.61	4660.88	4668.15	4675.42	4682.69	4689.96	4697.23
24	4626.38	4633.59	4641.17	4648.44	4655.71	4662.98	4670.25	4677.52	4684.79	4692.06	4699.33
25	4628.47	4635.69	4643.27	4650.54	4657.81	4665.08	4672.35	4679.62	4686.89	4694.16	4701.43
26	4630.56	4637.79	4645.39	4652.66	4659.93	4667.20	4674.47	4681.74	4689.01	4696.28	4703.55
27	4632.65	4639.89	4647.50	4654.77	4662.04	4669.31	4676.58	4683.85	4691.12	4698.39	4705.66
28	4634.74	4641.99	4649.60	4656.87	4664.14	4671.41	4678.68	4685.95	4693.22	4700.49	4707.76
29	4636.83	4644.09	4651.70	4658.97	4666.24	4673.51	4680.78	4688.05	4695.32	4702.59	4709.86
30	4638.92	4646.19	4653.80	4661.07	4668.34	4675.61	4682.88	4690.15	4697.42	4704.69	4711.96
31	4641.01	4648.29	4655.90	4663.17	4670.44	4677.71	4684.98	4692.25	4699.52	4706.79	4714.06
32	4643.10	4650.39	4658.00	4665.27	4672.54	4679.81	4687.08	4694.35	4701.62	4708.89	4716.16
33	4645.19	4652.49	4660.10	4667.37	4674.64	4681.91	4689.18	4696.45	4703.72	4710.99	4718.26
34	4647.28	4654.59	4662.20	4669.47	4676.74	4684.01	4691.28	4698.55	4705.82	4713.09	4720.36
35	4649.37	4656.69	4664.30	4671.57	4678.84	4686.11	4693.38	4700.65	4707.92	4715.19	4722.46
36	4651.46	4658.79	4666.40	4673.67	4680.94	4688.21	4695.48	4702.75	4710.02	4717.29	4724.56
37	4653.55	4660.89	4668.50	4675.77	4683.04	4690.31	4697.58	4704.85	4712.12	4719.39	4726.66
38	4655.64	4662.99	4670.60	4677.87	4685.14	4692.41	4700.68	4707.95	4715.22	4722.49	4729.76
39	4657.73	4665.09	4672.70	4679.97	4687.24	4694.51	4702.78	4710.05	4717.32	4724.59	4731.86
40	4659.82	4667.19	4674.80	4682.07	4689.34	4696.61	4704.88	4712.15	4719.42	4726.69	4733.96
41	4661.91	4669.29	4676.90	4684.17	4691.44	4698.71	4706.98	4714.25	4721.52	4728.79	4736.06
42	4664.00	4671.39	4679.00	4686.27	4693.54	4700.81	4708.08	4715.35	4722.62	4729.89	4737.16
43	4666.09	4673.49	4681.10	4688.37	4695.64	4702.91	4710.18	4717.45	4724.72	4731.99	4739.26
44	4668.18	4675.59	4683.20	4690.47	4697.74	4705.01	4712.28	4719.55	4726.82	4734.09	4741.36
45	4670.27	4677.69	4685.30	4692.57	4700.84	4708.11	4715.38	4722.65	4729.92	4737.19	4744.46
46	4672.36	4679.79	4687.40	4694.67	4702.94	4710.21	4717.48	4724.75	4732.02	4739.29	4746.56
47	4674.45	4681.89	4689.50	4696.77	4705.04	4712.31	4719.58	4726.85	4734.12	4741.39	4748.66
48	4676.54	4684.09	4691.70	4698.97	4707.24	4714.51	4721.78	4729.05	4736.32	4743.59	4750.86
49	4678.63	4686.19	4693.80	4701.07	4709.34	4716.61	4723.88	4731.15	4738.42	4745.69	4752.96
50	4680.72	4688.29	4695.90	4703.17	4711.44	4718.71	4725.98	4733.25	4740.52	4747.79	4755.06
51	4682.81	4690.39	4698.00	4705.27	4713.54	4720.81	4728.08	4735.35	4742.62	4749.89	4757.16
52	4684.90	4692.49	4700.10	4707.37	4715.64	4722.91	4730.18	4737.45	4744.72	4751.99	4759.26
53	4687.00	4694.59	4702.20	4709.47	4717.74	4725.01	4732.28	4739.55	4746.82	4754.09	4761.36
54	4689.09	4696.69	4704.30	4711.57	4719.84	4727.11	4734.38	4741.65	4748.92	4756.19	4763.46
55	4691.18	4698.79	4706.40	4713.67	4721.94	4729.21	4736.48	4743.75	4751.02	4758.29	4765.56
56	4693.27	4700.89	4708.50	4715.77	4724.04	4731.31	4738.58	4745.85	4753.12	4760.39	4767.66
57	4695.36	4703.09	4710.70	4717.97	4726.24	4733.51	4740.78	4748.05	4755.32	4762.59	4769.86
58	4697.45	4705.19	4712.80	4720.07	4728.34	4735.61	4742.88	4750.15	4757.42	4764.69	4771.96
59	4699.54	4707.29	4714.90	4722.17	4730.44	4737.71	4744.98	4752.25	4759.52	4766.79	4774.06
60	4701.63	4709.39	4717.00	4724.27	4732.54	4739.81	4747.08	4754.35	4761.62	4768.89	4776.16

The Anti-Godemannian.

deg	61°	62°	63°	64°	65°	66°	67°	68°	69°	70°	deg
0°	4659.23	4774.98	4904.94	5050.42	5218.81	5404.51	5604.04	5814.82	6034.35	6268.12	0°
1	4661.29	4777.11	4907.14	5052.70	5221.18	5407.18	5607.17	5817.57	6037.35	6271.34	1
2	4663.35	4779.25	4909.35	5054.09	5223.51	5409.51	5609.50	5819.90	6039.41	6273.77	2
3	4665.41	4781.38	4911.55	5055.47	5225.91	5411.91	5611.90	5821.90	6041.51	6276.19	3
4	4667.47	4783.51	4913.79	5056.85	5228.29	5414.29	5614.29	5824.29	6043.61	6278.61	4
5	4669.53	4785.65	4916.02	5058.25	5230.66	5416.66	5616.66	5826.66	6045.71	6281.02	5
6	4671.60	4787.79	4918.18	5059.63	5233.03	5419.03	5619.03	5829.03	6047.81	6283.43	6
7	4673.66	4789.92	4920.39	5061.03	5235.41	5421.41	5621.41	5831.41	6049.91	6285.85	7
8	4675.73	4792.06	4922.60	5062.42	5237.79	5423.81	5623.81	5833.81	6052.01	6288.27	8
9	4677.79	4794.20	4924.81	5063.81	5240.17	5426.21	5626.21	5836.21	6054.11	6290.69	9
10	4679.86	4796.34	4927.02	5065.20	5242.55	5428.61	5628.61	5838.61	6056.21	6293.11	10
11	4681.92	4798.49	4929.21	5066.60	5244.93	5431.01	5631.01	5841.01	6058.31	6295.53	11
12	4684.00	4800.63	4931.40	5068.00	5247.31	5433.41	5633.41	5843.41	6060.41	6297.95	12
13	4686.07	4802.77	4933.58	5069.39	5249.70	5435.81	5635.81	5845.81	6062.51	6300.37	13
14	4688.14	4804.92	4935.77	5070.79	5252.08	5438.21	5638.21	5848.21	6064.61	6302.79	14
15	4690.21	4807.07	4937.95	5072.18	5254.47	5440.61	5640.61	5850.61	6066.71	6305.21	15
16	4692.29	4809.21	4940.14	5073.57	5256.85	5443.01	5643.01	5853.01	6068.81	6307.63	16
17	4694.36	4811.36	4942.32	5074.96	5259.24	5445.41	5645.41	5855.41	6070.91	6310.05	17
18	4696.43	4813.51	4944.51	5076.35	5261.62	5447.81	5647.81	5857.81	6073.01	6312.47	18
19	4698.50	4815.65	4946.70	5077.74	5264.01	5450.21	5650.21	5860.21	6075.11	6314.89	19
20	4700.57	4817.80	4948.89	5079.13	5266.39	5452.61	5652.61	5862.61	6077.21	6317.31	20
21	4702.64	4819.95	4951.08	5080.52	5268.78	5455.01	5655.01	5865.01	6079.31	6319.73	21
22	4704.71	4822.10	4953.27	5081.91	5271.16	5457.41	5657.41	5867.41	6081.41	6322.15	22
23	4706.78	4824.25	4955.46	5083.30	5273.55	5459.81	5659.81	5869.81	6083.51	6324.57	23
24	4708.85	4826.40	4957.65	5084.69	5275.93	5462.21	5662.21	5872.21	6085.61	6326.99	24
25	4710.92	4828.55	4959.84	5086.08	5278.32	5464.61	5664.61	5874.61	6087.71	6329.41	25
26	4712.99	4830.70	4962.03	5087.47	5280.70	5467.01	5667.01	5877.01	6089.81	6331.83	26
27	4715.06	4832.85	4964.22	5088.86	5283.09	5469.41	5669.41	5879.41	6091.91	6334.25	27
28	4717.13	4835.00	4966.41	5090.25	5285.47	5471.81	5671.81	5881.81	6094.01	6336.67	28
29	4719.20	4837.15	4968.60	5091.64	5287.86	5474.21	5674.21	5884.21	6096.11	6339.09	29
30	4721.27	4839.30	4970.79	5093.03	5290.24	5476.61	5676.61	5886.61	6098.21	6341.51	30
31	4723.34	4841.45	4972.98	5094.42	5292.63	5479.01	5679.01	5889.01	6100.31	6343.93	31
32	4725.41	4843.60	4975.17	5095.81	5295.01	5481.41	5681.41	5891.41	6102.41	6346.35	32
33	4727.48	4845.75	4977.36	5097.20	5297.40	5483.81	5683.81	5893.81	6104.51	6348.77	33
34	4729.55	4847.90	4979.55	5098.59	5299.78	5486.21	5686.21	5896.21	6106.61	6351.19	34
35	4731.62	4850.05	4981.74	5100.00	5302.17	5488.61	5688.61	5898.61	6108.71	6353.61	35
36	4733.69	4852.20	4983.93	5101.39	5304.55	5491.01	5691.01	5901.01	6110.81	6356.03	36
37	4735.76	4854.35	4986.12	5102.78	5306.94	5493.41	5693.41	5903.41	6112.91	6358.45	37
38	4737.83	4856.50	4988.31	5104.17	5309.32	5495.81	5695.81	5905.81	6115.01	6360.87	38
39	4739.90	4858.65	4990.50	5105.56	5311.71	5498.21	5698.21	5908.21	6117.11	6363.29	39
40	4741.97	4860.80	4992.69	5106.95	5314.09	5500.61	5700.61	5910.61	6119.21	6365.71	40
41	4744.04	4862.95	4994.88	5108.34	5316.48	5503.01	5703.01	5913.01	6121.31	6368.13	41
42	4746.11	4865.10	4997.07	5109.73	5318.86	5505.41	5705.41	5915.41	6123.41	6370.55	42
43	4748.18	4867.25	4999.26	5111.12	5321.25	5507.81	5707.81	5917.81	6125.51	6372.97	43
44	4750.25	4869.40	5001.45	5112.51	5323.63	5510.21	5710.21	5920.21	6127.61	6375.39	44
45	4752.32	4871.55	5003.64	5113.90	5326.02	5512.61	5712.61	5922.61	6129.71	6377.81	45
46	4754.39	4873.70	5005.83	5115.29	5328.40	5515.01	5715.01	5925.01	6131.81	6380.23	46
47	4756.46	4875.85	5008.02	5116.68	5330.79	5517.41	5717.41	5927.41	6133.91	6382.65	47
48	4758.53	4878.00	5010.21	5118.07	5333.17	5519.81	5719.81	5929.81	6136.01	6385.07	48
49	4760.60	4880.15	5012.40	5119.46	5335.56	5522.21	5722.21	5932.21	6138.11	6387.49	49
50	4762.67	4882.30	5014.59	5120.85	5337.94	5524.61	5724.61	5934.61	6140.21	6389.91	50
51	4764.74	4884.45	5016.78	5122.24	5340.33	5527.01	5727.01	5937.01	6142.31	6392.33	51
52	4766.81	4886.60	5018.97	5123.63	5342.71	5529.41	5729.41	5939.41	6144.41	6394.75	52
53	4768.88	4888.75	5021.16	5125.02	5345.10	5531.81	5731.81	5941.81	6146.51	6397.17	53
54	4770.95	4890.90	5023.35	5126.41	5347.48	5534.21	5734.21	5944.21	6148.61	6399.59	54
55	4773.02	4893.05	5025.54	5127.80	5349.87	5536.61	5736.61	5946.61	6150.71	6402.01	55
56	4775.09	4895.20	5027.73	5129.19	5352.25	5539.01	5739.01	5949.01	6152.81	6404.43	56
57	4777.16	4897.35	5029.92	5130.58	5354.64	5541.41	5741.41	5951.41	6154.91	6406.85	57
58	4779.23	4899.50	5032.11	5131.97	5357.02	5543.81	5743.81	5953.81	6157.01	6409.27	58
59	4781.30	4901.65	5034.30	5133.36	5359.41	5546.21	5746.21	5956.21	6159.11	6411.69	59
60	4783.37	4903.80	5036.49	5134.75	5361.79	5548.61	5748.61	5958.61	6161.21	6414.11	60

The Anti-Gudermannian.

gd	71°	72°	73°	74°	75°	76°	77°	78°	79°	80°	gd
0	6145.20	6151.81	6158.42	6165.04	6171.65	6178.26	6184.87	6191.48	6198.09	6204.70	0
1	6146.27	6152.88	6159.49	6166.10	6172.71	6179.32	6185.93	6192.54	6199.15	6205.76	1
2	6147.34	6153.95	6160.56	6167.17	6173.78	6180.39	6187.00	6193.61	6200.22	6206.83	2
3	6148.41	6155.02	6161.63	6168.24	6174.85	6181.46	6188.07	6194.68	6201.29	6207.90	3
4	6149.48	6156.09	6162.70	6169.31	6175.92	6182.53	6189.14	6195.75	6202.36	6208.97	4
5	6150.55	6157.16	6163.77	6170.38	6176.99	6183.60	6190.21	6196.82	6203.43	6210.04	5
6	6151.62	6158.23	6164.84	6171.45	6178.06	6184.67	6191.28	6197.89	6204.50	6211.11	6
7	6152.69	6159.30	6165.91	6172.52	6179.13	6185.74	6192.35	6198.96	6205.57	6212.18	7
8	6153.76	6160.37	6166.98	6173.59	6180.20	6186.81	6193.42	6200.03	6206.64	6213.25	8
9	6154.83	6161.44	6168.05	6174.66	6181.27	6187.88	6194.49	6201.10	6207.71	6214.32	9
10	6155.90	6162.51	6169.12	6175.73	6182.34	6188.95	6195.56	6202.17	6208.78	6215.39	10
11	6156.97	6163.58	6170.19	6176.80	6183.41	6190.02	6196.63	6203.24	6209.85	6216.46	11
12	6158.04	6164.65	6171.26	6177.87	6184.48	6191.09	6197.70	6204.31	6210.92	6217.53	12
13	6159.11	6165.72	6172.33	6178.94	6185.55	6192.16	6198.77	6205.38	6211.99	6218.60	13
14	6160.18	6166.79	6173.40	6180.01	6186.62	6193.23	6199.84	6206.45	6213.06	6219.67	14
15	6161.25	6167.86	6174.47	6181.08	6187.69	6194.30	6200.91	6207.52	6214.13	6220.74	15
16	6162.32	6168.93	6175.54	6182.15	6188.76	6195.37	6201.98	6208.59	6215.20	6221.81	16
17	6163.39	6169.00	6175.61	6182.22	6188.83	6195.44	6202.05	6208.66	6215.27	6221.88	17
18	6164.46	6170.07	6176.68	6183.29	6189.90	6196.51	6203.12	6209.73	6216.34	6222.95	18
19	6165.53	6171.14	6177.75	6184.36	6190.97	6197.58	6204.19	6210.80	6217.41	6224.02	19
20	6166.60	6172.21	6178.82	6185.43	6192.04	6198.65	6205.26	6211.87	6218.48	6225.09	20
21	6167.67	6173.28	6179.89	6186.50	6193.11	6199.72	6206.33	6212.94	6219.55	6226.16	21
22	6168.74	6174.35	6180.96	6187.57	6194.18	6200.79	6207.40	6214.01	6220.62	6227.23	22
23	6169.81	6175.42	6182.03	6188.64	6195.25	6201.86	6208.47	6215.08	6221.69	6228.30	23
24	6170.88	6176.49	6183.10	6189.71	6196.32	6202.93	6209.54	6216.15	6222.76	6229.37	24
25	6171.95	6177.56	6184.17	6190.78	6197.39	6204.00	6210.61	6217.22	6223.83	6230.44	25
26	6173.02	6178.63	6185.24	6191.85	6198.46	6205.07	6211.68	6218.29	6224.90	6231.51	26
27	6174.09	6179.70	6186.31	6192.92	6199.53	6206.14	6212.75	6219.36	6225.97	6232.58	27
28	6175.16	6180.77	6187.38	6193.99	6200.60	6207.21	6213.82	6220.43	6227.04	6233.65	28
29	6176.23	6181.84	6188.45	6195.06	6201.67	6208.28	6214.89	6221.50	6228.11	6234.72	29
30	6177.30	6182.91	6189.52	6196.13	6202.74	6209.35	6215.96	6222.57	6229.18	6235.79	30
31	6178.37	6183.98	6190.59	6197.20	6203.81	6210.42	6217.03	6223.64	6230.25	6236.86	31
32	6179.44	6185.05	6191.66	6198.27	6204.88	6211.49	6218.10	6224.71	6231.32	6237.93	32
33	6180.51	6186.12	6192.73	6199.34	6205.95	6212.56	6219.17	6225.78	6232.39	6239.00	33
34	6181.58	6187.19	6193.80	6200.41	6207.02	6213.63	6220.24	6226.85	6233.46	6240.07	34
35	6182.65	6188.26	6194.87	6201.48	6208.09	6214.70	6221.31	6227.92	6234.53	6241.14	35
36	6183.72	6189.33	6195.94	6202.55	6209.16	6215.77	6222.38	6228.99	6235.60	6242.21	36
37	6184.79	6190.40	6197.01	6203.62	6210.23	6216.84	6223.45	6230.06	6236.67	6243.28	37
38	6185.86	6191.47	6198.08	6204.69	6211.30	6217.91	6224.52	6231.13	6237.74	6244.35	38
39	6186.93	6192.54	6199.15	6205.76	6212.37	6218.98	6225.59	6232.20	6238.81	6245.42	39
40	6188.00	6193.61	6200.22	6206.83	6213.44	6220.05	6226.66	6233.27	6239.88	6246.49	40
41	6189.07	6194.68	6201.29	6207.90	6214.51	6221.12	6227.73	6234.34	6240.95	6247.56	41
42	6190.14	6195.75	6202.36	6208.97	6215.58	6222.19	6228.80	6235.41	6242.02	6248.63	42
43	6191.21	6196.82	6203.43	6210.04	6216.65	6223.26	6229.87	6236.48	6243.09	6249.70	43
44	6192.28	6197.89	6204.50	6211.11	6217.72	6224.33	6230.94	6237.55	6244.16	6250.77	44
45	6193.35	6198.96	6205.57	6212.18	6218.79	6225.40	6232.01	6238.62	6245.23	6251.84	45
46	6194.42	6199.03	6205.64	6212.25	6218.86	6225.47	6232.08	6238.69	6245.30	6251.91	46
47	6195.49	6200.10	6206.71	6213.32	6219.93	6226.54	6233.15	6239.76	6246.37	6252.98	47
48	6196.56	6201.17	6207.78	6214.39	6221.00	6227.61	6234.22	6240.83	6247.44	6254.05	48
49	6197.63	6202.24	6208.85	6215.46	6222.07	6228.68	6235.29	6241.90	6248.51	6255.12	49
50	6198.70	6203.31	6209.92	6216.53	6223.14	6229.75	6236.36	6242.97	6249.58	6256.19	50
51	6199.77	6204.38	6210.99	6217.60	6224.21	6230.82	6237.43	6244.04	6250.65	6257.26	51
52	6200.84	6205.45	6212.06	6218.67	6225.28	6231.89	6238.50	6245.11	6251.72	6258.33	52
53	6201.91	6206.52	6213.13	6219.74	6226.35	6232.96	6239.57	6246.18	6252.79	6259.40	53
54	6202.98	6207.59	6214.20	6220.81	6227.42	6234.03	6240.64	6247.25	6253.86	6260.47	54
55	6204.05	6208.66	6215.27	6221.88	6228.49	6235.10	6241.71	6248.32	6254.93	6261.54	55
56	6205.12	6209.73	6216.34	6222.95	6229.56	6236.17	6242.78	6249.39	6256.00	6262.61	56
57	6206.19	6210.80	6217.41	6224.02	6230.63	6237.24	6243.85	6250.46	6257.07	6263.68	57
58	6207.26	6212.87	6219.48	6226.09	6232.70	6239.31	6245.92	6252.53	6259.14	6264.75	58
59	6208.33	6213.94	6220.55	6227.16	6233.77	6240.38	6246.99	6253.60	6260.21	6265.82	59
60	6209.40	6215.01	6221.62	6228.23	6234.84	6241.45	6248.06	6254.67	6261.28	6266.89	60

The Anti-Gudermannian.

gd	81°	82°	83°	84°	85°	86°	87°	88°	89°	gd
0	8733.60	9145.40	9605.82	10130.89	10694.62	11332.52	12022.11	12801.43	13629.56	0
1	8745.46	9152.63	9614.03	10140.46	10707.11	11346.88	12041.27	12845.31	13657.34	1
2	8757.31	9159.81	9622.27	10150.07	10716.65	11361.31	12050.51	12854.54	13666.11	2
3	8769.16	9166.98	9630.52	10160.70	10726.22	11375.80	12059.91	12863.68	13675.00	3
4	8781.01	9174.12	9638.80	10171.37	10735.82	11390.34	12069.31	12872.80	13683.90	4
5	8792.87	9181.27	9647.09	10182.05	10745.47	11404.95	12078.90	12881.92	13692.80	5
6	8804.73	9188.84	9655.40	10192.77	10755.16	11419.62	12088.50	12891.04	13701.78	6
7	8816.58	9196.43	9663.74	10203.51	10764.89	11434.36	12098.16	12900.16	13710.78	7
8	8828.44	9204.02	9672.09	10214.28	10774.65	11449.16	12107.80	12909.28	13719.80	8
9	8840.29	9211.61	9680.37	10225.08	10784.44	11464.02	12117.44	12918.40	13728.82	9
10	8852.15	9219.20	9688.80	10235.90	10794.21	11478.94	12127.08	12927.52	13737.84	10
11	8864.00	9226.81	9697.28	10246.75	10804.03	11493.93	12136.72	12936.64	13746.86	11
12	8875.86	9234.42	9705.71	10257.64	10813.13	11508.99	12146.36	12945.76	13755.88	12
13	8887.71	9242.05	9714.15	10268.54	10822.26	11524.11	12156.00	12954.88	13764.90	13
14	8899.57	9249.68	9722.64	10279.48	10831.41	11539.29	12165.64	12964.00	13773.92	14
15	8911.42	9257.32	9731.14	10290.45	10840.59	11554.54	12175.28	12973.12	13782.94	15
16	8923.28	9264.97	9739.66	10301.45	10849.80	11569.88	12184.92	12982.24	13791.96	16
17	8935.13	9272.63	9748.20	10312.48	10859.03	11585.27	12194.56	12991.36	13800.98	17
18	8946.99	9280.29	9756.74	10323.54	10868.28	11600.73	12204.20	13000.48	13810.00	18
19	8958.84	9287.96	9765.34	10334.61	10877.55	11616.26	12213.84	13009.60	13819.02	19
20	8970.70	9295.63	9773.94	10345.72	10886.84	11631.87	12223.48	13018.72	13828.04	20
21	8982.55	9303.32	9782.57	10356.86	10896.15	11647.54	12233.12	13027.84	13837.06	21
22	8994.41	9311.02	9791.21	10368.03	10905.48	11663.27	12242.76	13036.96	13846.08	22
23	9006.26	9318.73	9800.00	10379.24	10914.83	11679.06	12252.40	13046.08	13855.10	23
24	9018.12	9326.45	9808.80	10390.48	10924.20	11694.91	12262.04	13055.20	13864.12	24
25	9029.97	9334.18	9817.62	10401.75	10933.59	11710.82	12271.68	13064.32	13873.14	25
26	9041.83	9341.92	9826.46	10413.05	10943.00	11726.78	12281.32	13073.44	13882.16	26
27	9053.68	9349.67	9835.32	10424.38	10952.43	11742.80	12290.96	13082.56	13891.18	27
28	9065.54	9357.43	9844.20	10435.74	10961.88	11758.87	12300.60	13091.68	13900.20	28
29	9077.39	9365.20	9853.10	10447.13	10971.35	11775.00	12310.24	13100.80	13909.22	29
30	9089.25	9372.98	9862.02	10458.55	10980.84	11791.18	12319.88	13109.92	13918.24	30
31	9101.10	9380.77	9870.96	10470.00	10990.35	11807.42	12329.52	13119.04	13927.26	31
32	9112.96	9388.57	9880.00	10481.48	11000.00	11823.71	12339.16	13128.16	13936.28	32
33	9124.81	9396.38	9889.06	10493.00	11009.68	11840.06	12348.80	13137.28	13945.30	33
34	9136.67	9404.20	9898.14	10504.55	11019.39	11856.46	12358.44	13146.40	13954.32	34
35	9148.52	9412.03	9907.24	10516.13	11029.12	11872.91	12368.08	13155.52	13963.34	35
36	9160.38	9419.87	9916.36	10527.74	11038.88	11889.41	12377.72	13164.64	13972.36	36
37	9172.23	9427.72	9925.50	10539.38	11048.67	11905.96	12387.36	13173.76	13981.38	37
38	9184.09	9435.58	9934.66	10551.05	11058.48	11922.57	12397.00	13182.88	13990.40	38
39	9195.94	9443.45	9943.84	10562.75	11068.31	11939.23	12406.64	13192.00	13999.42	39
40	9207.80	9451.33	9953.04	10574.48	11078.16	11955.94	12416.28	13201.12	14008.44	40
41	9219.65	9459.22	9962.26	10586.24	11088.03	11972.70	12425.92	13210.24	14017.46	41
42	9231.51	9467.12	9971.50	10598.03	11097.93	11989.53	12435.56	13219.36	14026.48	42
43	9243.36	9475.03	9980.76	10609.85	11107.85	12006.41	12445.20	13228.48	14035.50	43
44	9255.22	9482.95	9990.04	10621.70	11117.79	12023.34	12454.84	13237.60	14044.52	44
45	9267.07	9490.88	9999.34	10633.58	11127.75	12040.32	12464.48	13246.72	14053.54	45
46	9278.93	9498.82	10008.66	10645.48	11137.73	12057.35	12474.12	13255.84	14062.56	46
47	9290.78	9506.77	10018.00	10657.40	11147.73	12074.42	12483.76	13264.96	14071.58	47
48	9302.64	9514.73	10027.36	10669.35	11157.75	12091.54	12493.40	13274.08	14080.60	48
49	9314.49	9522.70	10036.74	10681.32	11167.79	12108.70	12503.04	13283.20	14089.62	49
50	9326.35	9530.68	10046.14	10693.32	11177.85	12125.89	12512.68	13292.32	14098.64	50
51	9338.20	9538.67	10055.56	10705.34	11187.93	12143.11	12522.32	13301.44	14107.66	51
52	9350.06	9546.67	10065.00	10717.38	11198.03	12160.36	12531.96	13310.56	14116.68	52
53	9361.91	9554.68	10074.46	10729.44	11208.15	12177.63	12541.60	13319.68	14125.70	53
54	9373.77	9562.70	10083.94	10741.52	11218.28	12194.93	12551.24	13328.80	14134.72	54
55	9385.62	9570.73	10093.44	10753.62	11228.43	12212.28	12560.88	13337.92	14143.74	55
56	9397.48	9578.77	10102.96	10765.74	11238.59	12229.65	12570.52	13347.04	14152.76	56
57	9409.33	9586.82	10112.50	10777.88	11248.77	12246.97	12580.16	13356.16	14161.78	57
58	9421.19	9594.88	10122.06	10789.94	11258.97	12264.32	12589.80	13365.28	14170.80	58
59	9433.04	9602.95	10131.64	10802.02	11269.19	12281.68	12599.44	13374.40	14179.82	59
60	9444.90	9611.03	10141.24	10814.12	11279.43	12299.07	12609.08	13383.52	14188.84	60

SMITHSONIAN TABLES

* From 82° 30' onwards interpolate by second differences.

TABLE VIII

CONVERSION OF RADIAN INTO ANGULAR MEASURE AND VICE VERSA

Conversion of Angular Measure into Radians.

n	Radians for n degrees	Radians for n minutes	Radians for n seconds	n	Radians for n degrees
1	0.01745 32925 2	0.00029 08884 1	0.00000 48481 4	61	1.06615 08437 2
2	0.03490 65850 4	0.00058 17769 2	0.00000 96962 7	62	1.08360 17362 4
3	0.05235 98775 6	0.00087 26653 3	0.00001 45444 1	63	1.09555 71487 6
4	0.06980 31700 8	0.00116 35538 3	0.00001 93925 5	64	1.11701 07212 8
5	0.08725 64625 0	0.00145 44410 4	0.00002 42406 8	65	1.13446 40138 0
6	0.10470 97551 2	0.00174 53295 5	0.00002 90888 2	66	1.15191 72963 2
7	0.12215 30476 4	0.00203 62175 6	0.00003 39369 6	67	1.16937 05788 4
8	0.13960 63401 6	0.00232 71056 7	0.00003 87850 9	68	1.18682 38613 6
9	0.15705 96326 8	0.00261 79938 8	0.00004 36332 3	69	1.20427 71438 8
10	0.17450 29252 0	0.00290 88820 9	0.00004 84813 7	70	1.22173 04264 0
11	0.19195 62177 2	0.00319 97703 0	0.00005 33295 0	71	1.23918 37089 2
12	0.20940 95102 4	0.00349 06585 0	0.00005 81776 4	72	1.25663 69914 4
13	0.22685 28027 6	0.00378 15467 1	0.00006 30257 8	73	1.27409 02739 6
14	0.24430 60952 8	0.00407 24349 2	0.00006 78739 2	74	1.29154 35564 8
15	0.26175 93878 0	0.00436 33231 3	0.00007 27220 5	75	1.30899 68390 0
16	0.27920 26803 2	0.00465 42113 4	0.00007 75701 9	76	1.32645 01215 2
17	0.29665 59728 4	0.00494 50995 5	0.00008 24183 3	77	1.34390 34040 4
18	0.31410 92653 6	0.00523 59877 6	0.00008 72664 6	78	1.36135 66865 6
19	0.33155 25578 8	0.00552 68759 6	0.00009 21146 0	79	1.37880 99690 8
20	0.34900 58504 0	0.00581 77641 7	0.00009 69627 4	80	1.39625 32516 0
21	0.36645 91429 2	0.00610 86523 8	0.00010 18108 7	81	1.41370 65341 2
22	0.38390 24354 4	0.00639 95405 9	0.00010 66590 1	82	1.43115 98166 4
23	0.40135 57279 6	0.00669 04287 0	0.00011 15071 5	83	1.44860 30991 6
24	0.41880 90204 8	0.00698 13170 1	0.00011 63552 8	84	1.46605 63816 8
25	0.43625 23130 0	0.00727 22052 2	0.00012 12034 2	85	1.48350 96642 0
26	0.45370 56055 2	0.00756 30933 3	0.00012 60515 6	86	1.50095 29467 2
27	0.47115 88980 4	0.00785 39815 3	0.00013 08996 9	87	1.51840 62292 4
28	0.48860 21905 6	0.00814 48696 4	0.00013 57478 3	88	1.53585 95117 6
29	0.50605 54830 8	0.00843 57578 5	0.00014 05959 7	89	1.55330 27942 8
30	0.52350 87756 0	0.00872 66459 6	0.00014 54441 0	90	1.57075 60767 0
31	0.54095 20681 2	0.00901 75341 7	0.00015 02922 4	91	1.58820 93592 2
32	0.55840 53606 4	0.00930 84223 8	0.00015 51403 8	92	1.60565 26417 4
33	0.57585 86531 6	0.00959 93105 9	0.00015 99885 1	93	1.62310 59242 6
34	0.59330 21456 8	0.00989 01987 0	0.00016 48366 5	94	1.64055 92067 8
35	0.61075 54382 0	0.01018 10873 0	0.00016 96847 9	95	1.65800 24892 0
36	0.62820 87307 2	0.01047 19755 1	0.00017 45329 3	96	1.67545 57717 2
37	0.64565 20232 4	0.01076 28637 2	0.00017 93810 6	97	1.69290 90542 4
38	0.66310 53157 6	0.01105 37519 3	0.00018 42292 0	98	1.71035 23367 6
39	0.68055 86082 8	0.01134 46401 4	0.00018 90773 4	99	1.72780 56192 8
40	0.69800 21008 0	0.01163 55283 5	0.00019 39254 7	100	1.74525 89018 0
41	0.71545 53933 2	0.01192 64165 6	0.00019 87736 1	110	1.89480 21771 0
42	0.73290 86858 4	0.01221 73047 6	0.00020 36217 5	120	2.09435 54523 0
43	0.75035 19783 6	0.01250 81929 7	0.00020 84698 8	130	2.29390 87275 0
44	0.76780 52708 8	0.01279 90811 8	0.00021 33180 2	140	2.49345 20027 0
45	0.78525 85633 0	0.01308 99693 9	0.00021 81661 6	150	2.69300 52779 0
46	0.80270 21558 2	0.01338 08575 0	0.00022 30142 9	160	2.89255 85531 0
47	0.82015 54483 4	0.01367 17457 1	0.00022 78624 3	170	3.09210 18283 0
48	0.83760 87408 6	0.01396 26339 2	0.00023 27105 7	180	3.29165 51035 0
49	0.85505 20333 8	0.01425 35221 3	0.00023 75587 0	190	3.49120 83787 0
50	0.87250 53258 0	0.01454 44103 4	0.00024 24068 4	200	3.69075 16539 0
51	0.89000 86183 2	0.01483 52985 5	0.00024 72549 8	210	3.89030 49291 0
52	0.90745 21108 4	0.01512 61867 6	0.00025 21031 2	220	4.08985 82043 0
53	0.92490 54033 6	0.01541 70749 7	0.00025 69512 5	230	4.28940 14795 0
54	0.94235 86958 8	0.01570 79631 7	0.00026 17993 9	240	4.48895 47547 0
55	0.95980 21883 0	0.01599 88513 8	0.00026 66475 2	250	4.68850 80299 0
56	0.97725 54808 2	0.01628 97395 0	0.00027 14956 6	260	4.88805 13051 0
57	0.99470 87733 4	0.01658 06277 9	0.00027 63438 0	270	5.08760 45803 0
58	1.01215 20658 6	0.01687 15159 1	0.00028 11919 4	280	5.28715 78555 0
59	1.02960 53583 8	0.01716 24041 1	0.00028 60400 7	290	5.48670 11307 0
60	1.04705 86508 0	0.01745 32923 2	0.00029 08882 1	300	5.68625 44059 0

Conversion of Radians into Angular Measure.

Radians	Angle	Radians	Angle
0.1	05 43 46.89662 47	0.006	0 30 37.88883 75
0.2	11 27 32.60124 64	.007	34 01.85394 37
0.3	17 11 06.41087 48	.008	27 30.13845 00
0.4	22 53 03.06119 08	.009	30 56.38225 62
0.5	28 38 52.40312 35	0.0100	0 34 22.64866 25
0.6	34 22 38.88424 83	.0001	00 26.68448 05
0.7	39 56 25.39167 49	.0002	00 41.25266 12
0.8	45 30 11.81199 77	.0003	01 01.37944 59
0.9	51 43 58.32962 23	.0004	01 24.50192 25
1.00	57 17 44.86634 71	0.0005	0 01 43.13249 31
0.01	00 33 22.64866 25	.0006	02 03.72888 27
0.02	01 08 45.36962 49	.0007	02 24.78546 43
0.03	01 44 07.08118 71	.0008	02 45.00184 59
0.04	02 17 49.30212 35	.0009	03 05.63812 36
0.05	02 51 53.42312 31	0.00100	0 03 26.26486 625
0.06	03 26 15.38842 48	.00001	00 02.06661 866
0.07	03 59 48.53612 73	.00002	00 04.12529 612
0.08	04 33 01.38189 08	.00003	00 06.18796 419
0.09	05 06 25.34799 23	.00004	00 08.25059 225
0.100	05 43 46.89662 47	0.00005	0 00 10.31331 031
0.001	00 03 26.68448 02	.00006	00 12.37588 847
0.002	00 06 53.36962 25	.00007	00 14.43853 614
0.003	00 10 16.79143 07	.00008	00 16.50118 450
0.004	00 13 45.03012 50	.00009	00 18.56383 256
0.005	00 17 11.17963 42	0.00010	0 00 20.62648 022

BRITISH STANDARD TABLE

Numerical Constants.

$\log_{10} 2 = 0.30103 99694 63924$	$\frac{1}{\sqrt{2}} = 0.70710 67811 86548 47756$
$\log_{10} 3 = 0.47712 12549 43498$	$\log_{10} \frac{1}{\sqrt{2}} = 9.73143 96636 52033$
$\log_{10} 4 = 0.60206 99946 00106$	$\sqrt{\frac{2}{\pi}} = 1.25331 41373 15500$
$\log_{10} 5 = 0.69897 00043 40139 03882$	$\sqrt{\frac{2}{\pi}} = 0.79788 45608 02865$
$\log_{10} 6 = 0.77815 55001 42698$	$\log_{10} \sqrt{\frac{2}{\pi}} = 9.90191 06614 81924$
$\log_{10} 7 = 0.84509 80400 14328$	1 radian = 206264.80624 70964 seconds
$\log_{10} 8 = 0.90309 00147 25371 01104$	= 3437.74677 07849 minutes
$\log_{10} 9 = 0.95424 25094 35381 40900$	= 57.30577 95131 degrees
$\frac{1}{\pi} = 0.31830 99404 83996$	$\log_{10} 206264.80625 = 5.31442 51332$
$\frac{1}{\pi^2} = 0.10132 11836 42383$	
$\frac{1}{\sqrt{\pi}} = 1.77245 38509 05516$	

BRITISH STANDARD TABLE